

# AMERICAN EDUCATIONAL MONTHLY.

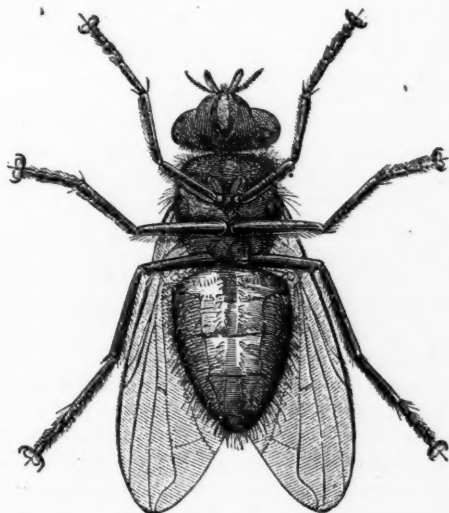
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## THE FLY AND THE MICROSCOPE.

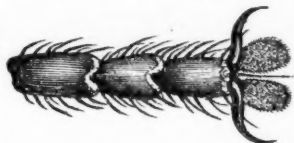
THE accompanying cut represents the under surface of a common house-fly, as seen in the Novelty Microscope. This instrument, by an admirable contrivance, confines the insect within the focus during the examination, and yet does not interfere with its freedom of motion ;



indeed, to witness the activity and sprightly movements of the insect, is one of the most interesting features of the examination. He moves this way and that with the utmost agility, as if conscious of the restraints of his prison walls, and anxious for his freedom ; for a moment he forgets himself, stops his frenzied motions, rubs his fore-feet together with apparent delight, hastily brushes the dust from his face and eyes, and around he goes again—but all to no purpose. He feels the smooth surface of

the transparent glass above him, if he can not see it ; finally, he concludes he will taste it : up comes his proboscis in contact with it, giving you a fine opportunity to view this organ ; but the glass is tasteless to him, he gathers no sweet, and around he goes again, never reconciled to his situation.

The fly, when thus viewed beneath the microscope, presents many points of great interest. You have seen him walk on the window-pane or upon the under surface of smooth glass, with his body downward. Look at his feet, and you will see how he does this. He has two sharp claws, but they can not penetrate the glass to sustain even his slight weight, so they turn to one side ; but between the claws are two membranous expansions, or soft cushions, which come in contact with the glass, as you will notice, and adhere to its surface, either owing to atmospheric pressure, or the exudation of a sticky fluid on the surface of these soft bodies. Below is a correct representation of a fly's foot, which has been mounted in Canada balsam, between a thick and a very thin piece of glass, as seen in the Craig Microscope. There is quite a diversity in the appearance of the feet and legs of the different varieties of flies.



The wing of a fly, how beautiful in color, yet how delicate ! and what a wonderful organ is his great motionless eye, with its cornea composed of over 4,000 little six-sided faces or eyes, through which the insect looks in different directions !

But of what use are flies, is an inquiry often made. They are scavengers, and delight not alone in sweet things, but in unclean things also, especially in decaying animal-matter, sucking up the juices which by decomposition would contaminate the air. Their principal service, however, is rendered while in the state of infancy. The eggs of the blue-bottle, or blow-fly, are deposited on putrifying animal substances, and are known as fly-blows. In a warm temperature they are hatched in three or four hours, and the maggots begin their work immediately. Nearly all insects are hatched from eggs which are laid by the parent on the substances that are to serve for the food of the young. But a singular exception is made in the case of some flesh-flies. To enable the maggots to enter promptly upon their appointed tasks, they are produced alive ; and so prolific are they, that Réaumur observed twenty thousand in a single fly ; and they are so voracious that they increase in weight upwards of two hundred-fold in twenty-four hours. It is an oft-quoted saying of Linnæus, that the maggots from three flies will consume a horse as quickly as a lion. They come to full growth in three or four days ; then they leave the filth which they were ordained to assist in removing, crawl away to some convenient crevice, or burrow in the ground, and turn to egg-shaped pupæ, which

look more like seeds than living animals. After a few days they burst their shell, and come forth as fully developed flies ; or, if the season is late, they remain unchanged during the winter, and emerge when warm weather returns.

The different-sized flies are not young and old, as some suppose, but different varieties. The house-fly is a domestic insect, and is said never to be found except in the vicinity of man's present or recent habitation.

The saw-fly is also an interesting object for the microscope. It is quite unlike the common-fly, and belongs to a different order of insects. There are several varieties, but the green and striped saw-flies are most common. The former may be found late in summer amid the grass, the latter on the twigs and leaves of bushes and trees, especially on peach-trees and blackberry bushes. They are a sluggish insect, fly heavily, and do not attempt to escape when touched. Their peculiarity consists in the saws with which the females are provided. These are lodged in a slit under the hinder part of the body, and are covered by two narrow scabbard-like pieces. They are hinged so that they may be withdrawn from their sheath, and moved up and down when in use. The different varieties of flies have saws of different patterns, but they generally curve upward and taper toward the end, and are toothed along the convex edges. Each of the saws is provided with a back to steady it ; but unlike the carpenter's saw, the blade is separated from the back, and slides upon it. Each saw also is covered on one side with transverse rows of fine teeth, giving it the power of a rasp as well as a saw. With these curious and ingeniously contrived tools the fly cuts narrow slits in leaves and fruit and the tender bark of twigs, for the purpose of depositing therein its eggs.

It is worthy of special notice that each fly has a *pair* of saws running side by side—a hint from nature, the founder of all mechanical science, to our mechanics and inventors.

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GRAMMAR-SCHOOLS OF ENGLAND.—The oldest grammar-schools in England, to which positive date can be ascribed, are those of Watton-under-Edge, founded in 1384 ; Grinston in Norfolk, 1394 ; Owestry, 1408 ; and the Free Grammar-school at Enfield, Middlesex, 1418. Doubtless, there are many older schools of the class, but their dates are unknown. That of St. John's, Huntingdon, is said to have been founded in the time of Henry II., by David, earl of Huntingdon. Those founded before the end of the fifteenth century are, besides the above, those at Higham Ferris, 1422 ; Seven Oaks, 1432 ; Ewelme, Oxford, 1436 ; Wye, Kent, 1447 ; Magdalen College School, 1480 ; Brackley, 1483 ; Reading, 1486 ; Hall, 1486 ; Stockport, 1487 ; Chipping Campden, 1487 ; Wimborne Minster, 1491 ; Sudbury, 1491 ; Loughborough, 1495 ; Chichester Prebendal School, before 1497, and Crewkerne, 1499.

## MILITARY DRILL FOR SCHOOLS OF ALL KINDS.

## I.

MAJOR R. was conversing with the principal of a flourishing boarding-school on the introduction of the military system. The principal said, "I should like to make the trial, but I can not afford the expense this year. We might use wooden guns." The major smiled. "Why, Mr. S., the guns are the very last thing. The really practical part of the system does not require arms." Many consider the military system in schools a puerile imitation of the "pride, pomp, etc."—a rather expensive amusement, but well enough if it does not interfere too much with study. They never think that it can be of use in the management of schools, in maintaining good order and discipline, in teaching boys how to stand and how to walk, and in forming habits of attention and prompt obedience.

The greatest advantages of drill can be secured without uniforms or arms. There are two distinct ends to be attained in drilling infantry soldiers; the first, readiness and skill in the use of weapons; the second, promptness and regularity in marching and maneuvering; and this last, even in warfare, is the most important. It is the marching part of the tactics which can best be made useful in the school. This is the embodiment of long experience in devising means for causing the movements of bodies of men to be executed simultaneously, regularly, and with the least fatigue; and prejudice against it as being military should not prevent its adoption in schools.

The instructions we shall give can be used in every kind of boys' school, from the primary to the highest grade.

## THE RUDIMENTS OF INFANTRY TACTICS.

First teach your pupil the habit of standing motionless in a position in which he is ready for any movement, and the habit of giving his whole attention to you. His position should be corrected gradually; but from the very first, the strictest attention should be insisted upon. This can be secured best by an animated tone in the teacher, by skillfully varying the exercises, and by rewarding faithful attention with frequent rests. When a movement is badly executed, reserve it till the end of the drill, then cause it to be executed again and again, dismissing each as soon as he performs it properly. Above all, do not make the drill too long.

Arrange your boys in one rank—that is, side by side, at a distance of a pace. Tell them to straighten themselves up and draw their heels together till they touch. "Look at your feet, and turn out your toes like the letter V. Now, take a last look, for you will never be allowed to see them again on drill. Throw your shoulders back and your chest out.

Keep your palms turned a little forward. The hands should hang easily, but well back, not in front of you. Stiffen your knees. Look straight to the front. Now lean forward the upper part of your body till you can easily raise your heels from the floor. That's right. You have done so well that I will not explain the next order—*REST*." After a few seconds of relaxation, tell the class to take the position again at once, and without looking down. Tell them that this attitude is called that of attention, and that the order for it is, "*Atten-t-i-o-n - - - SQUAD*." The first word is a warning ; and, by the time the second is pronounced, every one must be in his place, in the correct position, and motionless. When the order "*REST*" is given, they must not leave their places, but may change their position, and may talk. Practice these two commands several times.

Next teach the facings. To face to the right or left, turn a quarter of a circle entirely on the left heel as a pivot, raising the toe slightly. The right foot is also kept clear of the ground, the first impulse of the facing being given by the right toe. With stupid or awkward boys commence in this way : Show them that they can stand steadily on the left foot with the right raised slightly ; then, that they can balance on both heels ; and at last, that it is possible to stand for an instant on one heel with the toe of the same foot and the whole of the other foot raised. The commands for these facings are, if a squad is addressed, "*Squad, right - - - FACE*," and "*Squad, left - - - FACE*." Caution the squad that at the first two words nothing is to be *done* ; but they are to *think* which way to turn. See that each one knows his right hand from his left. In obstinate cases, make the boy who can not tell his right hand hold it up during the drill.

A word here about giving commands. Commands are printed in two parts, called the *preparatory command* and the *word of execution*. The former only indicates the movement, the latter the instant it is to commence. The words of preparation are spoken *distinctly* ; that of execution, *forcibly*. There should be a sufficient interval between them to count three deliberately. The preparatory command must be given just as it is written ; and it must be so framed that there will be no doubt as to what the next word will be. For example, do not say, "*Right - - - FACE*," as many do, but, "*Squad (company or battalion), right - - - FACE*." There is another command, "*Right - - - DRESS* ;" and if no distinction is made, the squad, instead of being fully prepared to obey, will not know what to do till they hear the remaining word. The result will be great unsteadiness. Again, suppose the executive syllable to be indistinctly pronounced, as must frequently be the case ; if the prefatory command is ambiguous, confusion must result. Remember that "*Right - - - DRESS*," and "*Company, right - - - FACE*," are correct ; "*Right - - - FACE*," and "*Company, right - - - DRESS*," are incorrect.

The command "*Attention*," which is given after a rest, is uttered loudly, dwelling on the last syllable, and is always followed by the designation of

the body addressed, thus : "*Atten-t-i-o-n - - - SQUAD,*" or, "*Atten-t-i-o-n - - - BATTALION.*" This command is uttered with the *falling* inflection ; all others with the *rising*.

Of course, the teacher will exemplify each movement before causing it to be executed by his class. Face them several times to the right, coming back at last to the original front ; then in the same manner to the left, and, lastly, intermix the two till the boys know them so well that you cannot "catch 'em."

A "rest" will now be in order.

We have one more "face" to learn—the "about-face." It is a *half-circle* to the right on *both* heels. The command is, "*Squad, about- - - FACE.*" The "*about*" is not a word of preparation alone, but of execution. The position of the feet is changed. The left foot is turned on the heel so as to point the toe to the front, the right is raised a little and placed behind the left, at right angles with it, like a letter T, the top being the right foot. At the command "*FACE,*" turn on both heels ; the right foot will be a little in advance of the other, and must be drawn back.

An exercise on all three of the facings combined may next be given, after which we will proceed immediately to marching, which of course has been promised as a reward for attention.

In marching we must consider, first, time ; second, direction ; third, length of step. There are three rates of speed or kinds of time used in our system of drill—common time, which might more appropriately be called slow time, of 90 steps per minute ; quick time, of 110 ; and double-quick, from 140 to 180. Quick time is the one generally used in marching ; when no rate is mentioned, this is the one meant. Common time is a slow rate, employed exceptionally, as in teaching the step. Double-quick time is a slow run or trot, used when an extraordinary rate of speed is required. Direction of step in its variations forms maneuvers ; in the elementary drill, it is in a straight line. The length of step must, of course, be uniform. For men, it is fixed (in quick and common time) at twenty-eight inches. For boys, it is difficult to make a standard. The greatest difficulty, in fact, experienced in drilling boys is to make them take steps of equal length. Twenty-three inches is perhaps a fair average for an ordinary class of boys. In a school where none are more than twelve years of age, twenty inches might be long enough.

Commence instruction in marching, or, in other words, teaching the boys to walk, by taking one step at a time. At the word "*Left,*" the left foot will be carried forward one pace ; at the word "*Right,*" the right foot ; and so on alternately, pausing at each step till the body is perfectly steady. The body must not deviate from its position at "*Attention ;*" the shoulders must be kept square, the toe must be turned out, the foot straightened so that the toe is as nearly as possible in the direction of the leg ; it must be carried close to the ground and planted flat.

After each step, correct the positions of the whole line. The most frequent faults will be leaning forward or back, stepping too long or too short, throwing forward the shoulder on the advancing side, looking at the feet, raising them too high, bending the knee too much, and striking the heel first. If your space is limited, when the squad reaches its bounds give the command "Halt" instead of "Right," when the right foot will be brought up beside the left to its position at Attention. Then order an "About-face," and commence again with "Left." Gradually quicken the steps as they are made more correctly, until they are tolerably perfect. Next follows marching in common time. The steps will be made as nearly like those just taught as possible. Before giving the order, which is "Squad, *forward, common time* - - - MARCH," indicate to your squad the rate at which they are to move by counting "one - - two, - - one - - two," in the exact time of ninety per minute. (A pendulum 17.38 inches long, which may be made with a bullet and a string, beats ninety per minute.)

At the preparatory command, the weight of the body is thrown on the right foot, leaving the left free to move. At "MARCH," step off with the left foot, making the feet strike the ground in the same time as the voice counted "one - - two." The teacher will count with the feet at first. The same faults are to be guarded against as in the divided step.

Quick time differs from common time only in the rate, which is one hundred and ten steps per minute. The length of the corresponding pendulum is 9.78 inches. The words "common time" are omitted in the command.

When the squad is to be halted, the command is "Squad, - - - HALT." Never omit the caution "squad," or the halt will be shuffling and irregular. The word "squad" is to be pronounced at four paces from the place where the halt is to be made, and just as the right foot strikes the ground. The word "halt" is spoken three paces afterward, and also as the right foot falls. The left foot will be just commencing a pace. It will complete it and remain in place, and the right foot be brought up to its side.

Your boys now understand the "facings" and the principles of the march, and are able to stand up "like soldiers." If they have been taught this small portion of the tactics thoroughly, it will benefit them.

We shall next commence to maneuver our squad as an organized body; and then, not only will the drill be more interesting, but the teacher will be able to begin using it in the movements of his classes. The instructions for these elementary principles have been made very minute, that the teacher may have a perfect knowledge of the subject. It will be best for him not to wait for the same perfection in his command, but to diversify the drill by movements which we shall describe hereafter.

The drill can be so conducted that the boys will consider it—not as so much extra duty—but as recreation, and enjoy it as such.

## TEACH THE CHILDREN TO SING!

THE benefits attending the study of geography and history, English reading and grammar, are seen and admitted by all intelligent people. The utility of mathematics and philosophy, and the ancient and modern languages, is quite generally understood and conceded. But what are the claims of music as a regular branch of education? Is there any cogent reason why—to say nothing at present about instrumental music—children should not be *universally* taught to sing? Upon this interesting as well as important question we have a few words to say.

1. Music is a *science*, as well as an art. Johnson gives it a place among the seven liberal branches of knowledge. The abstract and speculative principles upon which it depends have been fully and plainly elucidated, and satisfactorily tested in practice. From the Bible, and Grecian classics, and Egyptian antiquities, we learn that music was a science in very ancient times. No doubt it was then in a very crude and imperfect state. But the first elementary principles were then understood; and since that it has progressed, until now it is developed as a most beautiful branch of knowledge. As such it should be taught, and no person's education is complete who is not acquainted with its fundamental principles.

And here, we may remark, is a great defect. While in our public, and many of our private schools, music is taught as an art, it is not usually taught as a *science*. Perhaps a few lessons are given upon the first rudiments, but for the most part, children in this country are only taught to sing by rote. They hear the melody, and easily catch it; and if they have a good ear, and ordinary musical talent, they may put in the subordinate parts, and complete the harmony. If, in this loose way, they learn to sing, how much more proficient they would become if early inducted in this beautiful science!

2. *Every child, except the unfortunate mute, is endowed with musical powers.* He or she has a voice, and that voice is capable of making different intonations. It can make high sounds and low sounds, hard sounds and smooth sounds. It can indicate anger and joy, hatred and love. And it is reasonable to suppose, that the child who can talk and shout, laugh and cry, can also, if properly instructed, learn to sing.

Nor is this a mere theory or supposition. In certain parts of Germany as great care is observed in teaching children to read music, as to read writing or printing, and lack of natural ability for the one performance is no more complained of than for the other. And in our own country, distinguished musicians, like Professor Hastings, declare that they have never met with a person, young or old, who, if he had a voice, could not learn to sing.

No doubt, some have a greater talent, and are more likely to become

proficients in the science, than are others. So it is in all departments of learning. But he who has but one talent should not be permitted to bury it,—he should be taught to use it. Every child who can articulate, can, with some pains, learn to sing—to sing correctly, if not beautifully. His wise and beneficent Creator means that he shall sing, or He would not have thus endowed him. And if we do not teach our children to glorify their Maker in noble song, the warbling birds and bleating flocks will reproach us and them, and the choirs of heaven will look down in pity and astonishment.

3. Music has ever been regarded as a *great and innocent amusement*. It is such to those who listen, but still more to those who participate intelligently and correctly in the song. It not only affords relaxation for the weary mind, but likewise relief for the burdened spirit. It reassures the desponding, elevates the downcast, cheers the drooping. It acts like an angel of mercy to the mourner. The heart that is almost broken with sorrow is comforted as it listens to the sweet and plaintive melody; and if the voice can be controlled so as to join in the strain, how great and indescribable is the relief! The gentle Kirke White well said:

“Oh, surely melody from heaven was sent  
To cheer the soul, when tired of human strife;  
To soothe the wayward heart by sorrow rent,  
And soften down the rugged road of life.”

4. But music does more. *It exerts a most salutary influence upon human character and conduct.*

It soothes the passions. When a tempest rages in the soul, and conflicting waves leap furiously, one upon another, the soft strain of melody, as it approaches, and is more distinctly heard, subdues the storm, and at once there is a great calm.

Music operates favorably upon the affections. Every thing like asperity it removes. The mind, which naturally inclines to indifference, it fills with generous emotions. It renders pliable the feelings. It dispels selfishness and promotes benevolence; and thus its influence is in the highest degree ennobling.

Mark its effect also upon the taste—how refining! Upon the energies—how animating! It frowns upon all that is low and grovelling—upon all that is dull and stupid; and produces lofty aspirations and lively movements.

Upon these and other points we might dwell at considerable length, but our object is not to write a lengthy and elaborate article. We simply wish to suggest to professors and teachers, and trustees, throughout our land, the importance of a more thorough and complete instruction of this great and delightful science. We hope to see the day when it will be placed beside grammar, arithmetic, and geography, and be taught efficiently in all our schools.

U. S. M.

## THE ORIGINAL "SQUEERS."

[The following, from an exchange, may prove interesting to our readers who may have entertained doubts that Dickens' "Squeers" was an overdrawn character:]

A CONVERSATION with a gentlemanly Englishman, now traveling in this country, is communicated to the press.

In the midst of a familiar chat, he asked, "Did you ever read Dickens' 'Nicholas Nickleby?' " I answered, "Yes."

"Well," returned he, "old Squeers was my old master, William Shaw." And here you have the rest of his story: "One day, when I was about nineteen years old, as I was passing by a bookstore on Holborn Hill, London, near the Saracen's Head hotel, I saw a finely, though comically devised picture of a schoolmaster. On stopping to observe it more carefully, I recognized the lineaments of my old Yorkshire schoolmaster, Shaw; purchased the volume containing the picture, and found that it was Dickens' 'Nicholas Nickleby.' A short time afterwards, I met an old school-fellow by the name of Bishop, from whom Dickens got the facts of the school part of the story; he told me that he had put Dickens in possession of them, as the surest way he knew of to pay off old Shaw for his brutality."

I asked him in what part of Yorkshire the Shaw Academy (Dotheboy's Hall) was situated; and his reply was, at Bows. And then by piecemeal we examined the characters of Squeers (Mr. Shaw), Mrs. Squeers (Mrs. Shaw), Miss Squeers (Miss Helen Shaw), and Master Wackford (Mr. Johnny Shaw).

"Mrs. Shaw was to a dot as Dickens represents her. She used to take all our lead-pencils, paper, shirts, collars, etc., and either sell them or give them to Johnny. Oh, what a hateful little fellow was Johnny! He'd steal our balls, and, as we didn't dare speak to his father about them, he always kept them. Miss Shaw is unfairly drawn by Dickens; she was well educated, and considerably refined, having been sent to a first-class ladies' boarding-school. Mr. Shaw was a very passionate man; and when enraged at a boy in school, would order two boys to hold him down upon a table, one holding down his head, the other his feet, and then would gash his bare back with birch sticks. But no boy in school dared cry when whipped, for if he did the other boys pinched and kicked him when they got out of doors. Mr. Shaw never taught any branches except reading and spelling. The reading exercise consisted of Bible reading by the whole school, one hundred and twenty boys—two verses apiece; and the writing exercise, of two lines, of large and small hand. If any boy, in either of these exercises didn't satisfy Mr. Shaw, he would forthwith lay him out on the table, order two boys to hold him down, and flog him till he got tired. One day, getting angry at a boy for a slight fault in pen-

manship, he struck him with a rod, and cut open his right cheek. The assistant masters were orphaned boys, whom cruel guardians had apprenticed to him. One of them had a large fortune left him by his parents, but his guardian had apprenticed him to Shaw as farmer-boy and teacher, and had kept the fortune for himself. Mr. Shaw's large farm was cultivated by the boys. If they didn't work hard enough they were flogged, or allowed half rations. For nearly two months they had to work at haying, the school being divided into throwers and rakers. After the haying, old Shaw would say to the boys in the writing-class, 'I'll not flog the rakers, for their hands are sore; but woe unto you, throwers!'

"He used to go to London twice a year, and then the boys had to write letters telling their parents what a good man Mr. Shaw was, and how kindly he treated them. Before the letters were written, he used to say, 'I defy a boy of you to say that I ever took away a collar, shirt, or even a pin from him;' but Mrs. Shaw always did that part of the business. When in London he quartered at the Saracen's Head. Once in three weeks the boys were ranged in rows, and the assistant masters went around and saw whether each boy had his lead spoon, fork and knife in hand; if he hadn't them, he lost his pocket-money for two or three months. After the publication of *Nicholas Nickleby*, Mr. Shaw lost all his pay scholars, and so he apprenticed his apprenticed schoolmasters to shoemakers, blacksmiths, and carpenters. Mrs. Shaw in about two years afterward died of a broken heart. Her contemptible old husband died almost an idiot. Helen married a low drinking fellow; Johnny became a London loafer; and the second son, Jonathan, who studied medicine, spent whatever was left of the old man's property among his fellow students in drinking and high living generally; but for some years has been the village physician in his native place, Bows. John Brodie actually existed in John Doats, the village shoemaker, who had the humane habit of helping the boys in running away from 'Shaw's dungeon,' as he called the school.

"When a boy came to the school, his clothes and other things were taken possession of by Mrs. Shaw, and he was given pants of leather which had been worn by generations of boys before him, and which had been so patched with different-colored pieces of cloth that the poor school-boys mistakenly called them 'Joseph's coat of many colors.' When Mr. Shaw and all the contemptible tribe of Yorkshire schoolmasters had been shown up and ruined by Dickens' *Nickleby*, the *London Dispatch* came out, advising Shaw and his fellow-sufferers to prosecute Dickens for libel; but my brother and I, who by bitter experience knew the truth of Mr. Dickens' exposition, wrote to the editor of that paper, assuring him that the book was almost literally true. And then the *Dispatch* pitched into Shaw more savagely than Dickens had done. *Nicholas Nickleby*, or rather a young Londoner, came into the school as assistant teacher after I left."

## CARBON IN VEGETATION—ITS SOURCE.

THE great source of carbon to vegetation is stated by chemists to be the carbonic acid diffused through the atmosphere. It is absorbed by the leaves of growing plants, and decomposed in them under the influence of light; and while a portion of the carbon is retained, oxygen, carbonic oxide, and carburetted hydrogen are eliminated. Another portion of carbonic acid is supplied to the roots of plants in the state of solution, in water; but this, also, is chiefly derived from the atmosphere, being washed from it by falling rain.

The amount of carbonic acid present in the air varies with the season, the weather, and the location; the proportion being greater in summer than in winter, at night than by day, in cloudy weather than in clear, and greater inland than at sea. Though it is never absent, it seldom constitutes more than one part in two or three thousand of the atmosphere; and since only about one-fourth part of carbonic acid is carbon, the proportion of this element in the air is estimated to be, on an average, but little more than one part in ten thousand. Even this small quantity is not considered by chemists to be a necessary constituent of the air; its presence is merely incidental, and is attributed mainly to the secondary sources—combustion, respiration, and decay. It is true, that this quantity, though relatively small, is actually great, when we consider the immense bulk of the atmosphere; but is it great when compared with the vast requirements of vegetation? Is this supply commensurate with the demand? It may be; but it is, to say the least, in striking contrast with the liberality of nature in other instances. Water, also, is required by vegetation, and in about the same proportion as carbon; but would vegetation flourish in an atmosphere containing only one part of water in ten thousand? The average proportion of water in the air is more than a hundred times that of carbon; yet this is not sufficient for vegetation. An almost infinite source of supply is afforded by the saturated ground and the waters that cover the greater part of the earth. Now, if the moisture in the air is not enough for the support of vegetation, is it reasonable to look to a source less than a hundredth part as great for the necessary supply of carbon? The one is required as much as the other; and we would naturally expect that the supply of each would not be very unequal. As it is, we must either suspect nature of inconsistency, or chemists of error; and surely no one can hesitate between the two. But, it may be asked, if the carbon of vegetation does not come from the carbonic acid in the atmosphere, whence does it come? What other source can there be? A very plausible answer to this question has been suggested by Mr. Henry Kilgour, of Edinburgh, in a pamphlet re-

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cently published, in which he claims that nitrogen, which forms four-fifths of the atmosphere, is not an element, as is generally supposed, but is carbonic oxide in an allotropic state. He bases his argument upon the remarkable correspondence between the physical and chemical properties and action of these two gases, which differ no more than the different states of iron, phosphorus, and other well-known substances. In all cases in which they differ in the intensity of their action, carbonic oxide is the more active of the two; and he supposes that nitrogen is carbonic oxide which has its activity diminished by the action of heat, electricity, or some other force not at present known. This is not the first time that the supposed elementary character of nitrogen has been called in question; but hitherto no experimental proofs have been adduced to show that it is really a compound. Mr. Kilgour, however, offers an array of evidence that makes it appear not only possible, but quite probable that his theory is true. If it is correct, it will clear up many doubtful points in the economy of nature, not the least of which is this question of the source of carbon to the organic world. Instead of the limited and accidental supply of carbon afforded by the carbonic acid of the air, we are now directed to a source as vast as the atmosphere itself—more than three-tenths of which, according to this theory, is carbon.

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#### WILLIAM RAY'S HISTORY LESSON.

*William.* Come, Ed. ! what are you doing ? Let's have a game of ball.

*Edward.* I can't, Will. I must learn this history lesson.

*W.* A fig for your history lesson ! I've learned mine long ago.

*E.* What ! already ? Are you sure you know it ?

*W.* Yes ; well enough. What's the use of staying in the house all the morning to study that old lesson ?

*E.* Let's hear you say it.

*W.* Oh, I can't bother. I know it, and that's enough. We have enough of reciting in the class.

*E.* Just try it, and see if you know it *sure*. I don't believe you do.

*W.* I say I do ; so what's the use of saying I don't. You might as well tell me I lie. Don't you suppose a fellow can tell whether he knows a thing or not ?

*E.* I suppose he can—sometimes. But I sha'n't believe that you know this lesson until I hear you recite it. I'm sure *I* don't know it, and I've studied it twice as much as you have.

W. Well, try me and see. But just let me look at the book a minute to see how it begins. [*Looks.*]

[*Enter James, quietly.*]

"Early on the morning of the thirteenth of September the—the—Early on the morning of"—[*Hesitates, hangs his head and moves his lips as if repeating to himself.*]

E. Well ; go on.

W. The—Oh ! I know now ! "The British, under General Mont-  
clam—"

E. [*Laughing.*] Breakfasted on chowder, I suppose.

W. I won't say another word, if you don't stop laughing. It's mean to laugh, when a fellow miscalls a word.

E. Well ; I won't laugh any more, if I can help it. Come, begin again. You'd better try this verse : "General Wolfe, with an army of eight thousand men—"

W. Oh, yes ! I know. "General Wolfe, with an army of eight thousand men, scalded the Heights of Abiram." What are you laughing at ?

E. [*Laughing.*] Come, now ; that's fine ! Scalded the Heights of Abiram. Where did you—

W. I say it's in my book, now, just so ! See if it isn't !

E. Well, look and see ; s-c-a-l-e-d. What does that spell ?

W. Scaled, of course. Well, I thought I was right. Oh ! Abraham. Any way, there isn't much difference ; and what's the use of being so mighty particular about a word or two. History is a mean thing to learn anyhow.

E. That's a fact, Will. It is a mean thing to learn *anyhow*, but a very pleasant thing to learn right. But let me ask you a few questions. Who commanded the English ?

W. Ha ! aint you smart ? Don't you think you've got me now ? There wasn't any English there !

E. [*After a quiet laugh.*] Well, then, who did fight there ?

W. Why, the British and the French.

E. Who commanded the French ?

W. General Wolfe.

E. What became of him ?

W. He was killed, wasn't he ? Oh ! I know the lesson now ! He was mortally wounded—and—(drawling and speaking as though the words were one sentence)—"They fly who fly said the dying hero the French said a soldier then I die content said the hero and immediately expired."

E. That's it, exactly ! You do know a thing or two, don't you ? But never mind those old wars and dead heroes. Let's talk about our own war. You read the papers, don't you, Will ?

W. Of course I do! Do you think I'm a spooney, because I missed a word or two in my history lesson?

E. What do you think of General Grant's report?

W. I thought it was a very good thing; didn't you?

E. Yes, very. That account of the battle of Baltimore was splendid, wasn't it?

James [*Stepping forward.*] The battle of—

E. Be quiet, James! Let us alone. I'll go with you directly. [*To William.*] Didn't you read the report of the conduct of the war after Grant took command, and all about the terrible battle at Baltimore, where the Alabama was sunk and the Monitor did such execution?

W. Well—no—not—quite—all—of—it; but it was dreadful, wasn't it?

E. It was that! You remember that splendid charge that the rebels made just as the gunboats came round Cape Hatteras and opened fire on them. They had just crossed the Chickamauga, and—

W. Yes, I remember; but I read it in a hurry, and may have forgotten some parts.

J. Come, Ed., that's too much! There—

E. Keep still, Jim; there's time enough. I'll come out all right. [*To William.*] You see, General Scott came up to the rebels, who had about a million of men strongly posted along Tennessee. The fight lasted three days, you remember, and our troops were being overpowered, when Grant came up with half a million of men, and, dashing into the thickest of the fight, rallied our forces; and, when the monitors came up, drove the rebels across the Chickahominy, and took the most of 'em prisoners, and—

W. Yes, I know; I remember all about it. But, you see, I must go, now. Tom's waiting for me. [*Exit.*]

E. Well; I think you'd better go. [*Calling after him.*] Say! Can't you spend time some rainy Saturday to write a history of the war? You'd make a capital hand; you have such an excellent memory, and—

J. Don't be so hard on the poor fellow, Ed., if he is a fool and won't own it. What possessed you to lie so?

E. I didn't lie. He said he had read Grant's report, and I said he knew so and so, then. He did all the lying.

J. It was laughable, I confess; but was it fair?

E. Well, no; perhaps not. But it was as near the truth as he would have got if he had the report for a lesson. He pretends to know so much that I can't help running him a little sometimes. There goes the first bell! If I don't make up for lost time, Will may give me a hint to mind my own lessons more, and his less.

J. And I too. I came in to study.

## JULIAN GURDON: SCHOOLMASTER.

## CHAPTER IV.

## THE SECOND DAY.

THE close of the first day's exercises found me exhausted, without having encountered opposition or defiance. It was the weariness of my struggle with an imperturbable stupidity, the downfall of my high hopes and boundless aspirations. I had imagined myself the center of a circle of youthful minds, all ardent in the pursuit of knowledge, all with appetites sharpened by a taste at the Pierian spring, and anxious to quaff huge draughts of its life-bestowing waters. I had scarcely been conscious of these hopes till now that they were destroyed, and I stood sorrowful amid their ruins. I wished myself again in the classic shades of Elmtown.

But the atmosphere of that cheerful home, and a night of quiet slumber, removed despondency and restored my equilibrium. I returned with fresh courage to the duties of the second day. I was now better prepared for what I was to encounter, because better informed. I had, however, another lesson to learn, for which I was utterly unprepared. One by one my scholars came in. Few were waiting for me: they had, to-day, no curiosity to gratify.

On the previous day I made out a list of needful books for each pupil, and sent it to the parents, with a request that they might be procured as soon as possible. This morning nearly every scholar brought a message to the effect that his father or mother thought it unnecessary to purchase more books. Those he had, had always been deemed sufficient by other teachers, and his "schoolin'" was going to cost enough without throwing away money on a parcel of new books.

I was dismayed. Making bricks without straw was an easy task, I thought, compared with mine. My sole appliances and apparatus consisted of these tattered volumes, in their depressing variety, a huge walnut ruler, a leaden inkstand, and a thick willow withe, which substituted the conventional "birch." I had not a chart, nor even a blackboard. I concealed my dismay, however, and returning some trifling answer to each message, I resolved to consult Deacon Lawrence before proceeding further.

I commenced the exercises of the school by reading a brief portion of the New Testament, and then requesting the children to repeat with me the Lord's Prayer. I had learned that it had been customary in the school to open the exercises with prayer, and as I had no gift for extemporaneous petition I preferred to use the divinely appointed words. My request was followed by an exchange of glances, and an audible "snicker"

running round the whole school-room. Only one pupil followed my example and knelt, and but five or six voices followed my utterance. I was wise enough to make no allusion to this when I rose, but I determined to do so on some future occasion, and to urge compliance with my request. I now observed, for the first time, the scholar who had knelt with me. This was her first day, and my duty was to examine the books she had brought, and to assign her lessons.

She was a fair, delicate child, of perhaps twelve years of age. Her features, with a child's prettiness, were refined in expression. Her hair was smoothly brushed, and covered by a net, such as was then worn by little girls. Her dress was such as was worn by my sister Emma's pupils, of Elmtown. She was evidently a new-comer, transplanted from some city or large town, and in utter contrast with the little girls by whom she was surrounded. She differed from them in dress and mien no more than in quality. Her modesty was unlike their rustic shyness. Her delicate, but not sickly fairness, unlike their ruddy health. Not prettier than half a dozen others, she was graceful where they were hoydenish, low-voiced where they were boisterous, sprightly where they were rude. And yet it was a difference to be felt more than seen. I saw at once that this was the child of a cultivated mother, and that to have her for my pupil must be a gain to me.

I asked her the usual questions. She gave her name as Mary Lee ; and, in her clear childish voice, she told me about her studies, and how far she had advanced in the text-books, which filled the neat satchel. Setting her some tasks for the day, I turned away.

Two new boys, big, burly fellows, had joined the school. One had a shock of red hair, standing out like an aureola around his freckled face, large, flapping ears, and small, deep-set eyes, of the color of pale sherry. The other was dark, sallow, and sullen, with eyes of velvet blackness, and hair as black, perfectly straight, and falling, *a-la-Chadband*, down each lank cheek, and over the retreating forehead. I foreboded mischief.

Both looked defiantly—the one active, the other sullen.

Red hair informed me, in a high, squeaking voice, that he expected to read in the "Testament." He might do some sums, and get a "jography lesson sometimes." Black hair brought an ancient arithmetic, of a sort which I had condemned the day before, and "reckoned he might parse a little."

I quietly informed the one that the New Testament would not be used as a reading-book in the school, and told the other that he must bring another arithmetic. I turned away, knowing that the struggle had begun. Was I to be master or to be mastered? It is no shame to me now, to say that, boy as I was, and brave enough at heart, I trembled inwardly. I was a stripling and a student. Physically, these boys, neither of them as old as myself, were my superiors. In a moral contest, I should doubt-

less come off conqueror. But if the strife was to be decided by muscle, I knew that I should be but as an infant in the hands of either of them.

I proceeded quietly with my duties, but before the morning session closed, I perceived that the leaven of insubordination was spreading. Entirely new to my present duties, I felt unable to act without a guide, and resolved to do nothing until I had consulted my good friend the deacon. I knew that I had but the alternative of maintaining my authority or abandoning my engagement.

It was not a happy morning that I spent listening to the droning voices of the children, slowly making their way through their reading lessons; although at another time there might have been much to touch my keen sense of the ludicrous in this monotonous measuring off of the stilted platitudes, and high-sounding moral and philosophical lessons of the English Reader, evidently without the slightest comprehension of their meaning.

On the whole, however, I was glad that this opposition had met me upon the threshold of my new career, that I had not been lulled into false security, only to be awakened by an unexpected blow. By the next day I should be prepared to meet my foes, or, finding them too strong for me, to withdraw without coming to a struggle. Of this latter course, however, I would not think. I was unwilling to show myself a coward, and certainly I did not feel like one. We were a quiet unaggressive race, the Gurdons; but some noted soldier-blood, as well as that of a missionary who had fought the good fight with as unflinching courage, had descended to me through my mother's veins. Should I flee before these rustic youths, brutal through ignorance, and with only the brute's unreasoning courage?

At noon, such of the pupils as resided near went home for dinner, but nearly all remained. After dinner, the boys played noisily outside, and the girls gathered in tittering groups within. I ate the apple-pie and doughnuts that Mrs. Lawrence had provided, and then turned to the copy-books which had accumulated upon my desk.

It was a part of my duties, I found, to "set" copies—to write straight marks, or "pot-hooks and hangers," in the books of the little ones, and some moral or proverbial sentiment in those of the elder pupils.

At intervals, while engaged in this task, the window near my desk was darkened, and looking up I caught Red-head with his nose flattened against the pane till it assumed the appearance of a huge white dot in the center of his glowing visage, while his fiery eyes shot at me gleams, half malicious, half mischievous. Peace was my policy for this day, however, and I took no notice. When the recess was over, and the school called, he and his companion had disappeared. As my trusty lieutenant, Robert Lawrence, was also absent, having gone to the nearest town to purchase books for his winter studies, I was well-pleased to insure this cessation of

hostilities. The afternoon passed quietly with the writing lessons, the rehearsal of the tasks learned in the morning, and a brief "talk" by myself upon the rudiments of geography. At the close, I congratulated myself on detecting a freshening air of interest in the school.

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## CHAPTER V.

### A CONSULTATION AND A CRISIS.

THAT night I had my promised consultation with Deacon Lawrence.

He had heard of my difficulties from the children who had hastened home to tell him that none of the scholars were going to get new books, and that Jim Howland and Andrew Haight had come to school "a purpose" to make a disturbance :—how they had uttered many disparaging criticisms upon my white hands and teeth, my well-brushed hair, and especially upon my "boughten clothes ;" and if they had not been seduced away by a dog-fight in the neighborhood, they would have broken out during the afternoon. Thus I found him well-informed upon the "situation," and able to appreciate its dangers and difficulties.

"I see that they mean trouble," said the deacon. "There was some dissatisfaction in the district when we hired you ; for your price, though I dare say it looks small enough to you, was larger than we are used to paying ; and they expected you, as a 'college larnt' youth, to put on airs. Even Mr. Lee, who has been about a year in the neighborhood, and has always regretted the poor schools, was opposed to your coming. But I'll bring you through. Hold your own. Be mild, but decided, and convince them that whatever requirements you make are really made for the good of the scholars, and the opposition will cease."

"But about these boys?" I asked, seeing that the good deacon had strayed into generalities.

"Wal !" he answered, judicially, "they mean mischief, that's certain, but they shan't do much while I'm trustee. Howland don't belong to this destrict, anyhow, and I'll turn him out, he's no right there ; and Haight's afeard of his guardeen, who's threatened, afore now, to take him over to the river and 'printice him to a trade. I ain't afeered but what I can manage 'em both."

"And about the books? Without apparatus or text-books, without even a blackboard, I do not see how I can do justice either to myself or to the pupils. I did succeed in arousing their attention to-day by a talk about geography, but I can hardly succeed in teaching them much without means of illustration."

"Wal, wal ! we'll see about that, too. You young folks are awful go-ahead, and think you know more than all the old ones. What's the matter with the books, hey?"

"They are old and ragged, and in every way behind the times. And they are of such various kinds that it is impossible to form classes, and thus waken a sense of emulation. Let us have modern books, and I'll engage that the scholars will progress twice as fast as will be possible with the present arrangement, or want of arrangement. You expect a mechanic, when you hire him, to work with good tools, and you would not expect a ploughman to scratch the ground with a crooked stick. How, then, can you expect me to cultivate these young minds, or to build up a fair fabric of knowledge for them, with worn-out and useless implements?"

"By George!" exclaimed the deacon, and this was his worst oath, "you're right, boy! I—I mean, Mr. Gurdon—but you look so young, I forget sometimes. I'll tell 'em this, and I do believe you mean to do the fair thing by us all. They can afford to pay something for a teacher who cares about the scholars' larnin' something, and they shall. The trustees can order a change of books in the school, and it shall be done."

From this speech I learned two things: that the deacon had been attached to the old ways, was a little jealous of newfangled notions, and that I had made a convert of him. I thought it best to conclude the conversation by saying that I had a number of charts and maps at home, which I would send for, if he would agree to have a blackboard made at once. And, as he assented with the utmost cheerfulness, I thought it best to say no more, but turned to Robert, who was waiting for help in his Latin lesson.

In the morning, the deacon informed me that he should call a school-meeting that night, and handed me a written notice, which Robert was to put up on the school-house door.

"I've got the rheumatiz terribly this morning," he said, "or I'd come down and see how you git along. But I will try and git well enough to go to the meeting to-night. I reckon them boys won't trouble you to-day. Try and git along peaceable, anyhow, till after to-night."

With this injunction, I proceeded to my third day's duties.

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MR. NAUDIN, whose essays have been published in the *Comptes-Rendus* of the French Academy, has been applying Darwin's animal theory to plants, and has been eminently successful. He has conducted numerous investigations upon the hybridism of plants, and he informs us that plants submitted to culture give rise to new forms, which at length, either by artificial or natural selection, acquire stability, and are even reproduced as if they were genuine species. He has concluded—and his observations seem to warrant his conclusions—that individual plants produced by cultivation, after a certain period, become as stable as real species, and deserve to be ranked among them.

## THE TEACHER IN THE SICK-ROOM.

**B**E not surprised, gentle reader ; we have not made a mistake. We do not mean the physician or the nurse in the sick-room ; they, of course, will be there. But we mean this : in many sick-rooms the teacher should be a frequent visitor.

Our mission is to benefit children ; and wherever they are to be found, there we should seek them. Not many of us will pass through our winter-term without missing first one and then another from the class and the school-room. Inquire, and you will be told they are sick. They may not be very ill ; they may be in their places again in a few days ; yet these absent ones must not be neglected.

We must visit them in their chambers of suffering. We must let them see and feel how much we care for them, how deeply we are interested in them. Go in with a bright, cheery smile, with sympathy in your heart and voice ; talk with them pleasantly for a little while, tell them something amusing if you can, try to do something for their comfort, and both you and they will be the better for your visit.

When any of my own pupils are detained from school by sickness they are sure of an early call from their teacher ; they *know* she will come. The frequent greeting of the mother is, " Good-evening, Miss Murray ; Fanny is expecting you ;" or if, perchance, I have been prevented from going as soon as usual, it will be, " I am glad to see you, Miss Murray ; Lizzie has been wondering why you did not come ;" and the brightening eyes of the little invalid, and their smiles of welcome, show that they do not consider it a mere visit of ceremony.

Not long since, a favorite pupil, who had been teaching in a neighboring town, came home very sick. I did not hear of it for several days, but called as soon as I did. Her first words were, " I am so glad you have come ; I did not feel as if it was quite home until I had seen you." Now, would not any teacher be gratified by such an assurance of even one pupil's regard ?

But, besides going, I often take with me something to amuse or interest the sick ones ; something to occupy their minds for a little while, and make them forget their suffering. Sometimes it will be a child's paper, a set of pretty cards, or a picture-book ; sometimes a new magazine, an album of choice pictures, or any thing I may have that is new, rare, or curious ; and, again, flowers or fruit, or some little delicacy to tempt a dainty palate. A rare flower in winter, or a few early violets in spring, will often carry fragrance and brightness into the dreary chamber, and hopeful thoughts to its sick and weary inmate.

No heart, especially no child's heart, is insensible to kindness ; and the

little attentions that may be shown to a sick pupil will often—I believe, always—be productive of permanent good. The susceptible nature of youth highly appreciates such evidence of tender consideration. It awakens a new sense of the teacher's interest in them, and inspires a new faith in the teacher's efforts for their improvement. The return to the school-room of a pupil who, during sickness, has been affectionately visited, is often marked by a more earnest effort to perform faithfully all school duties than has ever before been manifested, while a new light in the eyes shows that now, indeed, the teacher is regarded as a friend.

Children do not stop to reason about these things. Love begets love ; and when they once feel that a teacher really cares for them, their affection is spontaneously given.

Then, when a teacher, by genuine courtesy, both in and out of school, has won the hearts of his pupils, he may mold them as he will. Their desire to please him will know no limits. He may lead them to any height of mental attainment of which they are capable ; and, better than all, he may guide them in paths of moral truth and purity, and impress lessons of heavenly wisdom upon hearts that are ready to receive and profit by his teachings.

Another, and perhaps not a secondary consideration, is that children, ever more ready to learn from example than from precept, will insensibly adopt the habits of those whom they love and esteem. The little amenities and charities of life have a charm for their young hearts that needs but the encouragement of example to win them to all good and kindly deeds.

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HE whose sympathies with nature have taught him to feel that there is a fellowship between all God's creatures, to love the brilliant ore better than the dull ingot ; iodic silver and crystalized red copper better than the shillings and pennies forged from them by the coiner's cunning ; a venerable oak-tree than the brandy cask whose staves are split out from its heart-wood ; a bed of anemones, hepaticas, or wood violets, than the leeks and onions which he may grow on the soil and in the air they made fragrant ; he who has enjoyed that special training of the heart and intellect which can be acquired only in the unviolated sanctuaries of nature, "where man is distant, but God is near," will not rashly assert his right to extirpate a tribe of harmless vegetables barely because their products neither tickle his palate nor fill his pocket ; and his regret at the dwindling area of the forest solitude will be augmented by the reflection that the nurslings of the woodland perish with the pines, the oaks, and the beeches that sheltered them.—Marsh : "Man and Nature."

## DIMENSIONS OF THE EARTH—HOW ASCERTAINED.

TO many it is a matter of mystery how such facts as the exact dimensions of the globe on which we live, its distance from the sun, and the magnitude of the sun, are ascertained. It is supposed that none but astronomers and profound mathematicians can understand such matters. This is a mistake. For, although we may not have the ability of a Newcomen or a Watts to invent a steam-engine, there is no reason why we should not understand its operations after it is invented. So it is with the world. We may understand the methods employed to ascertain its magnitude, without being gifted with the mind of a Herschel or a Newton. The earth is so large that we can not grasp it, and so diversified with land and water, mountain and valley, that we can not walk about it in a direct line to measure its circumference; nor can we penetrate through it to ascertain its diameter; nor recede from it, to take such observations as would enable a land-surveyor to tell the height of an object on the opposite side of a river. Some other contrivance must be resorted to, in order to obtain the desired information. If the earth were strictly a sphere, the measurement of any of its great circles, such as the equator or a meridian, would give its circumference; or, as all circles, from the ring which adorns a lady's finger to the meridian which surrounds the world, are supposed to be divided into 360 equal parts, called degrees, it is evident that if we knew the length of one degree of a circle we could obtain the circumference. But how shall we know how much of the earth's surface corresponds to one degree of its meridian? The reader will please accompany me on an imaginary journey; but, before our departure, we will stroll out into the open fields, and, on some gentle eminence, will pause to survey the beauty of the azure vault above and around us, glittering with stars. We shall not fail to be impressed with the sensation that we are standing in the center of a vast dome, with its base resting on the horizon, and its summit directly over our heads. Now, let us find the North Polar Star, by whose guidance the wanderer in northern latitudes is directed. To do this, we must turn to that conspicuous object in the northern heavens, the "Dipper," a part of the constellation known as the Great Bear.

The two stars opposite the side of the Dipper to which the handle is attached, are called the "Pointers," because almost in a right line through them may be found the Polar Star. The Pointers are five degrees apart, a convenient measuring rule to find the number of degrees that one star is from another, or that a star is from the zenith or from the horizon. Looking in the direction indicated by the Pointers, and about four times the space between them, or about  $20^{\circ}$ , we shall find the object of our search. It is

not a very large or brilliant star; yet is larger and more conspicuous than any of the stars in its immediate vicinity.

Having found the star toward which the North Pole of the earth is directed, and measuring its distance from the horizon by the space between the Pointers, we find that it is about  $40^{\circ}$  from the horizon.

We now set out on our contemplated voyage, traveling directly south—that is, on a meridian of the earth—until we have gone over a distance of seventy miles. Looking back on the North Star, we find it one degree nearer the horizon than when we started. We travel another seventy miles. Our guide is two degrees nearer the horizon. Reflecting on the cause of this, we conclude that we must have traveled two degrees south on a meridian to cause the Polar Star to sink two degrees toward the northern horizon. Such is the fact; every degree of seventy miles (or, more correctly, of  $69\frac{1}{2}$  miles) traveled toward the south will make the star appear one degree nearer the horizon, until we reach the equator, when it will be seen glimmering on the verge of the northern horizon.

Continuing our journey southward, and leaving the star which has so far been our companion to sink from our view, we pass through the southern regions, and around on the other side of the world, northward, until we reach the equator, when our long-lost star will again appear. It will continue to rise as we advance, until we reach the north pole, when it will appear exactly over our heads, or in the zenith. Pursuing our journey southward and homeward, the star gradually sinking, we arrive at the city of New York,  $41^{\circ}$  degrees north latitude, with the Polar Star  $41^{\circ}$  degrees from the horizon.

Sufficient, it is presumed, has been said to show that we must look to the stars to tell us the length of the degrees of our meridians. Let us select some point, on an open plain, that shall have a star exactly in the zenith. Then the distance, either directly north or south of this station, that will cause the star chosen for our observation to appear just one degree north or south of the observer, will be the length of a degree on the earth's surface, which multiplied by 360, if the earth were strictly a sphere, would give its circumference. Such, in the main, are the means employed to find the dimensions of the world. But, in measuring these degrees or arcs of a meridian, it was found, by a series of observations, in different countries, in different latitudes, and by different mathematicians, that the degrees differed slightly in length, gradually increasing from the equator toward the polar regions, which proved that the earth, instead of being a sphere, is what mathematicians call an oblate spheroid.

Only one arc of a meridian has been measured in America, and that was about one hundred years ago, by those eminent astronomers and mathematicians, Mason and Dixon, who surveyed and established the famous boundary known as "Mason and Dixon's line," which separates Pennsylvania from Maryland.

## AMERICAN EDUCATIONAL MONTHLY.

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## THE REGIMEN OF BOARDING-SCHOOLS.

**M**AN, in opposition to every thing else in nature, thrives best when worst fed.

Very few would assent to this proposition as it stands ; but cover it with a little pseudo-science, and garnish it well with fine talk about physiology, health, beauty, simple diet, etc., and you have the actual, if not the avowed, theory of many. A man who would attempt to rear prize-cattle on straw would be likely to have his sanity doubted. Should he advocate a corresponding diet for men, he would be in danger of being called a philosopher. There are many such philosophers in these days ; and it has become very popular to commend a meager diet. Some even insist that our food should be strictly vegetable ; and are so infatuated with the theory as to practice it upon themselves. Others, and probably the majority, are not quite so sure, and are willing only to try it upon their children. It is a favorite notion with these theorists, that most of the various ills that flesh is heir to may be ascribed to one cause—over-feeding—especially during childhood. And so exaggerated are the effects attributed to “high living,” that parents, in their anxiety to be on the safe side, are unwittingly carried to the other extreme, and feed their children too little, instead of too much. While chemistry, physiology, and common experience alike teach that children require more abundant and more nutritious food than adults, they are generally put off with not only an inferior quality, but an inferior quantity.

Dr. Erasmus Wilson, speaking of this matter, says, that the practice of under-feeding children is almost universal ; and that the majority of the diseases of children arises from this habit of under-feeding.

If a person who has attained full growth does not desire much food, and prefers one kind to another, there is no reason why he should not gratify his taste and inclination ; but there is reason why he should not insist upon regulating the stomachs of others, especially of children, by his own.

Mr. Herbert Spencer, in his able work on “Education,” protests

strongly against this practice of under-feeding children, and the confidence with which most parents legislate for the stomachs of their children. "It proves," he says, "their unacquaintance with physiology. If they knew more, they would be more modest."

But it is not at home that children are likely to suffer most from the effects of this pernicious theory. It exerts a powerful influence in determining the regimen of our schools; and, what is worse, it is sometimes made a pretext, while profit is the actual motive. We would not be so unjust as to intimate that selfish motives alone govern those proprietors of boarding-schools, who, acting upon the theory that simple food is best for students, provide only the simplest elements of nutrition, and in the least possible quantity and variety. The majority are doubtless conscientious, and only the theory is in fault; but the kindest intentions will not atone for a vicious practice. It matters little to the pupils what the master's motives and opinions may be, so long as the rations run short.

"It is notorious," writes Dr. Wilson, "that the importance of a substantial diet is not sufficiently recognized in our scholastic establishments; and the consequence to the pupils is debility and disease, a constant appeal to the doctor for tonics, *vice* food; a frequent outbreak of ringworm; and, worse than all, the laying of a foundation for future organic disease and morbid life, or premature death." This evil is, doubtless, less frequent in this country than in England; but there is need of reform here.

Those who advocate a simple or vegetable diet, base their argument chiefly upon a chemical theory, still quite popular, although recent authorities have shown it to be unfounded in nature and fact; and, holding to the common theory of the nature and action of the various kinds of food, they will doubtless exclaim against the following, prescribed by Dr. Wilson, as a diet of health, capable of making a sound body, and also a sound mind; but it is founded upon reason and sound science; and we would like to see it established in every family and family school: "The diet of children of all ages, should be substantial breakfast, with animal food in some shape; a substantial dinner of meat, vegetables, and cereal pudding; and a substantial supper also, consisting in part of animal food. The drink may be milk, tea, cocoa, and possibly beer."

"There must be no putting off of the stomach," he adds, "with bread and butter and slops, as the effigies of two of the three meals of the day, but a generous intermingling of all the elements that constitute a sound and nutritious diet."

With such fare as this, plenty of time being given for digestion, the demands for growth and for the waste of the system occasioned by youthful activity and the brain-work required by long lessons, would be well supplied; and our children at school might be as hearty and healthy as they are when enjoying their summer vacations in the country.

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ELIPHALET NOTT, D. D., LL. D.

**D**IED, on the morning of January 29, the venerable president of Union College. His early life was spent in poverty, his parents having lost all their property by fire shortly before his birth, which occurred June 25, 1773. His earliest intellectual developments were extraordinary, and his desire for knowledge was insatiable. The lack of school facilities was more than supplied by the instructions he received from his mother, a lady of excellent sense, fine culture, and exemplary character. To this best of teachers, Dr. Nott was wont to ascribe whatever of success or excellence he attained in after-years. She died when he was twelve years of age; and shortly after he left Ashford, his birthplace, and went to live with his brother, Rev. Samuel Nott, at Franklin, Conn. Here he worked during the summer, and studied under his brother during the winter. He commenced teaching at the age of sixteen. Two years after, he took charge of the Plainfield Academy, prosecuting his classical studies at the same time, under the direction of Rev. Dr. Joel Benedict, whose daughter he subsequently married. At twenty he entered Brown University, where he continued about one year. He ranked at the head of his class, both in mathematics and languages, and graduated out of due course in 1795. After graduating, he studied for the ministry; was licensed to preach by the Congregational Association of New London County, and sent on a mission to the then destitute part of New York, bordering on Otsego Lake. After spending a time in this thinly-inhabited region, he was invited to settle in Cherry Valley, Otsego County, N. Y., in the double capacity of preacher and teacher. Both church and school flourished under his care until, in 1778, he accepted a call from the First Presbyterian Church of Albany. In 1804 he was chosen President of Union College, then in its infancy, burdened with debt, and without suitable buildings, library, or apparatus. Under the successful management of Dr. Nott the college rose rapidly from the humble condition in

which he found it—one professor and forty students meeting in a cabinet-maker's shop—to the honorable position which it has long occupied among the institutions of the land.

A teacher for nearly three-fourths of a century, his services in the cause of education have been equaled by few. His influence upon the young men of the country is beyond estimation, upward of four thousand having graduated at Union College during his long incumbency. His last appearance in the lecture-room was in September, 1860; at Commencement, in 1862. Since that time he has been gradually declining. He was buried in Vale Cemetery, Schenectady, Friday, February 2d.

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#### ENGLISH COMPOSITION.

**A** YOUTH, desiring to become a painter, enters, as a pupil, the studio of Mr. Artist.

He listens with patient attention to the preliminary lecture upon the greatness and utility of his chosen art, anxiously awaiting the instruction that shall open the way to its mysteries and rewards.

Just as he is ready for his first lesson, he is told—"Here are all the requisite materials—canvas, colors, pencils—every thing that you need. Set to work immediately. Take any subject from life, or history, or nature—any thing that you choose, and express your conception clearly. Be very careful that you do not copy or imitate any one, and be careful to use proper colors." "But," cries the pupil, "I never painted a picture in my life; I don't know how!" "Of course you do not," replies the teacher. "If you did, you would not come here to learn. But you know what a brush is, and can tell red from green, and blue from yellow: there is no reason, then, why you should not be able to paint. You can see as well as others; all you need is a little practice. It is not necessary that you take a difficult subject at first. In fact, it would be best for you to choose something simple—a landscape, for example, or a street scene—any thing that you are perfectly familiar with. Do the best you can, and bring your picture to me next week; I will examine it, and correct the errors, and then you can have it framed for exhibition!"

Writing is no less an art than painting. How is it, then, that a course commonly adopted for composition seems so absurd when applied to painting? Is not the absurdity as great in one case as in the other, only custom makes it less apparent?

## EDITORIAL CORRESPONDENCE.

BERLIN, February 4, 1866.

*University of Berlin—Faculty—Lectures—Barth—Advice to Students—German Language—English Universities—Books—Influence of the University of Berlin.*

THE great intellectual and scholastic center of the Prussian capital is the University, an institution which, although not yet half a century old, has shot up with such wonderful rapidity as to have outstripped all its German rivals; even if it may not be said to have taken rank higher than Cambridge and Oxford. Its foundations were laid on a grand scale, and some of the greatest men of Prussia's past co-operated in its establishment. Fichte, William Humboldt, Schleiermacher, Savigny, Niebuhr, and Stein labored together; and the result is worthy of their great names. All that the public spirit of the excellent Frederick William III. could do to give the institution success was done. A royal palace on the main street of the city, and most advantageously situated in every respect, was delegated for the use of the new University; the ablest men in Germany were called to the chairs; and among the younger professors were some men whose lives seemed indicative of great promise, among whom may be mentioned Bopp, Böckh, and Ritter. The stand taken at the first has never been abandoned. The University has never languished for the means of support; the ablest men are continually called to its chairs; and whenever a man in the smaller universities has reached signal eminence, Berlin endeavors to draw him hither. In this way, since I was here in 1860, the great orientalist, Rödiger, the life-long friend of our Robinson, has been drawn from Halle; Dörner, the most eminent theologian of Germany, with the possible exception of Rothe, at Heidelberg, has come from Bonn; and a special chair has been created for the great traveler Barth, whose lamented death has not yet run the round of the press. Hofmann, the great chemist, who, although a German by birth, sought fortune and fame in England, and found both, has come back to Germany again, and accepted a position in Berlin. The smaller universities do not decline as this greater one increases. They hold their own well; and Bonn and

Heidelberg, Gottingen and Halle, Leipsig and Breslau, all stand as well now as they have done for many long years. Nay, even the institutions whose names are little known to the world—Greifswald, Jena, Giessen, Kiel, Marburg, and those of similar grade—diminish, in respect to influence, very gradually; and there is scarcely one which has not one, two, or even more men on its corps of professors of first-class eminence.

In some departments of study, too, the smaller universities have precedence. It is generally admitted that the student of chemistry has to choose between Heidelberg and Gottingen; that the student of Hebrew history or literature must hear Ewald at Gottingen; that philology may be studied at Bonn and Leipsig, and history at Bonn and Heidelberg as well as at Berlin. But further than this we can not go. There are at each of these great universities, Bonn, Heidelberg, Gottingen, Halle, and Leipsig, a half-dozen men of great eminence—nay, of the greatest—but here at Berlin there are four times as many. And then, too, the great size of the faculty affords an opportunity of studying almost every subject in detail. Whatever language, ancient or modern, whatever branch of mathematics, whatever department of natural science are studied at all, are taught here by the most competent, and often by the most eminent teachers. Just glance at the composition of the faculty. The entire corps comprises not far from a hundred and sixty men. Among the names are found the great ones of Leipsig, the Egyptologist; Kiepert, the cartographer; Rose and Hofmann, the chemists; Petermann and Rödiger, the orientalists; Nitsch, Zwerten, and Dörner, the theologians; Ranke and Droysen, the historians; Virchow and Langenbeck, the physicians; Graefe, the oculist; Waagen, the art critic; Dore, the meteorologist; Böckh, Bekker, and Bopp, the philologists, and Marx, the musician. These may be the best known to the world at large; but there are many others who are thoroughly known in Germany—men of immense research and unbounded acquisition in the field which they have chosen.

A glance at the list of the lectures given the present term may serve to show the

minuteness of the subdivision of studies. As I open it, my eye falls first upon the various languages taught here. In addition to the Latin, Greek, and Hebrew, which are taught not only in connection with well-known authors, but with inscriptions on ancient stones and the deciphering of manuscripts, we have, as a matter of course, all the chief languages of modern Europe, including the Turkish, the Greek, the Polish, and the Russian. In addition to these, we have the old German, the old English, the Anglo-Saxon, the Sanscrit, Hindustani, Persian, Arabic, including the interpretation of the Koran; Syriac, Chaldaic, the ancient Egyptian, and the comparative grammar of all the Semitic tongues. Nor are these languages taught by men who have a mere rudimentary acquaintance with them; they are in the hands of men whose reputation, like that of Lepsius and Rödiger, is world-wide.

Take, again, the two departments of geography and history, which are rightly connected here, and shown to be interdependent. The distinguished Von Raumer is lecturing on the "History of Civil Constitutions;" the scarcely less eminent Droysen is upon "Greek History;" Ranke upon the "Parliamentary History of England;" Droysen is delivering a second course upon the "European Revolution from 1780 to 1815;" Köpke on "German History;" Meyer on the "History of the German Universities;" Petermann on the "History of the Armenians;" Lepsius on "Egyptian History;" Erdmansdorf on the "General History of Civilization," and Müller on the "History of the New World." This does not include the lectures on ecclesiastical history, of which there are always several courses. We have in the kindred department alluded to above, Müller on the "Geography and Ethnography of Europe;" Kleport on "Ancient Geography;" and Barth on the "Physical and Comparative Geography of the Mediterranean Basin." The latter man, whom it is a great privilege to have known as a friend, has just passed away, in the midst of his honors and labors. In his perilous African expedition he undermined his constitution; and, although at my last interview he looked extremely well, he passed away at last so suddenly that there was not time even to call a physician. The earth has just closed upon his remains.

But what I have written above is enough

to show the wonderful subdivision of study which exists here, and the breadth of ground covered by the whole corps of lecturers. Let me sum up this part of my subject in a word, by saying that there are almost four hundred courses of lectures now going on in this University of Berlin. They go so far out of the ordinary round of our American curriculum as to embrace dancing, fencing, and riding. They range from the profoundest science and philology down to the most graceful discussions of the lighter branches of modern literature.

And yet, I would not wish to say a word in this letter which should impel young men in America to come to Germany in search of instruction. Great as are the advantages of study in such a university as this, I believe that the obstacle imposed by this difficult German language is such as to make it advisable to visit those universities where the veil of a foreign tongue is not between the speaker and the hearer. There are microscopists in England who are so little inferior to Ehrenberg, that even the scientific world would be puzzled to tell which to prefer; but it is a piece of senseless folly for a young man beginning to learn microscopy to pass over England to come and put himself under the great Ehrenberg, and always have the film of an obscure interpretation of his master's language disturbing the reception of his instruction. And what is true here is true of almost every thing. There is hardly a subject which is not taught as well in the English language as in the German. There is no greater ichthyologist in the world than our Agassiz; no greater geographer than our Guyot; there are no geologists who stand higher than Buckland and Lyell; no astronomer, than Airy; no physicists, than Faraday and Tyndall; and were I to choose between London and Berlin as a place of study, I should, on account of the great weight of the reason given above, not hesitate a moment in giving the preference to London. Yet we find that Americans hurry over London to the continent. Even Edinburgh offers, in some respects, and Cambridge and Oxford in others, greater advantages than are afforded here; for while there may not be so wide a range of studies possible, they each are the home of some men who are almost unrivaled in their special department. Germany looks up to England quite as much as England looks to Germany; and

even the Germans, with all their pride of scholarship, are surprised that we can pass over England and come to them.

I can not emphasize enough the difficulty placed in the way by the acquisition of the German language. Fifteen years' acquaintance with it makes me safe in asserting this; and I do not hesitate to say that at least two years must be spent on the language alone before one can go from lecture-room to lecture-room, and understand every word that is spoken, and forget the veil between the speaker and the hearer. Nay, I can go further, and say that I do not know a man who has been in this country for three years who has got over all the difficulties which lie in the way, and who hears a lecture in German as he would hear one in English.

Add to this, that all the good books—the books, at any rate, which are better than the English and the American ones—are instantly translated, and there remains not a reason why one must sacrifice pains, and time, and money, in visiting even such a thoroughly equipped university as this of Berlin. In King's College, London, in Edinburgh University, in Dublin University, not to speak of Cambridge and Oxford, there are lectures constantly given; and those of the first three are accessible to all who wish to hear them, while their lists of professors leave little to be desired.

I can say what has been written above with much more confidence now than ten or twenty years ago. Then Germany was, in some departments at least, the teacher of the world. Geography could only be studied of her Ritter and Humboldt; Von Buch was the dominant authority among geologists; in music, Germany had incontestable superiority, and in art she reigned without a rival. But the artists and scholars who stood incontestably higher than those in England have all passed away. Humboldt, Ritter, Buch, Mendelssohn, Schadow, Schumann, Rauch, Kiss, are all among the dead. Still, in reference to Germany, and not to the wants of American students, I can not express too great praise at the great strength and illustrious position of the university which is the subject of this letter. It is one of the marked objects of the world of culture; it is one of the centers of thought. Remotely or immediately, it extends its influence to the ends of the earth.

W. L. G.

KINGSTON, N. Y.

**M**R. EDITOR—Please allow a friendly criticism on the communication of "J. J. S.," in your January number. The statement in the first paragraph is fully indorsed. The next, concerning the officer who thought he could "teach school," is passed over.

It is to be regretted that any teacher should make statements like those in the remaining portion of the article. It is not clear that a child's inclination is against study; and I do not understand how a child "picks up the *sounds* of letters from a tin plate!"

If the boy had forgotten the letters, why put him through the stunting process again? It is not seen what was gained after he had learned the letters by the "hoop" and "saw-buck" method; and it is difficult to see what that lesson had to do with "object teaching."

It will be pleasant to know how the letter B resembles an "ox-shoe," and also how the boy would understand that O-X spell ox or oxen, by the teacher's pointing to the animals feeding.

The changing of a boy that was "unusually dull" to one that was "as bright as need be," in one evening, was certainly very remarkable. It is well that the scene was laid in a "foreign" country.

I should have said nothing, if the article had not appeared in an influential educational journal, that, in some degree, seems to sanction the views of the writer, "J. J. S." It will do harm, because it indorses and tends to promote and perpetuate a method of primary teaching that should long ago have been forgotten.

T. O. GARFOOTE.

#### THE SACRED ELEPHANT OF INDIA.

**A**N article in your January number entitled "Curious Arithmetical Calculations," reminds me of a heathen legend, which, perhaps, will prove amusing to your juvenile readers, if not edifying to older people.

In India it is currently reported and believed that somewhere there is an immense elephant, which, on account of his size and influence, is an object of worship. It is said that this animal has seven heads; protruding from each head are seven tusks; upon each tusk are seven water-tanks; out of each water-tank spring seven water-

lilies; connected with each lily are seven leaves; upon each leaf are located seven palaces; and in each palace is a lady who has five hundred attendants to do her bidding.

Now, a nice question in arithmetic is, how many people resided on this seven-headed monster? Will they number as many as the army of our late brave defenders? How far will they come short of the population of this great republic? Let us see.

The elephant's heads are, . . .	7
His tusks, . . . . .	49
The water-tanks, . . . . .	343
The lilies, . . . . .	2,401
The leaves, . . . . .	16,807
The palaces, . . . . .	117,649
The people, . . . . .	53,942,149

Nearly fifty-nine millions of people. On the supposition that these people are neither pigmies nor giants, but of ordinary size, what a tremendous weight that poor animal must perpetually sustain! R. S.

### CURRENT PUBLICATIONS.

A VALUABLE addition has been made to our list of text-books.<sup>1</sup> Mr. Brooks has evidently given much attention to his subject, and his book shows careful preparation. His "Suggestions to Teachers" are well worthy of attention, and his method of analysis is clear and logical. He has avoided many of the errors of writers upon mental arithmetic; but we fear that he has fallen into a greater error—that of overestimating the mental powers of those for whom he has written.

He tells us in the preface, that "the work is not designed for the child's first book in the science of numbers, and, therefore, the more elementary operations have not been needlessly enlarged upon; yet the arrangement is so systematic, and the transition from the easy to the complex so gradual, that even very young pupils can pursue it with ease and advantage." This opinion we can not share. In fact, we feel quite certain that, for young pupils, the book will be neither easy nor advantageous. There is much in it that will tax all the powers of pupils well advanced.

It would have been much better had the author "enlarged" more upon the "elementary operations," and been more sparing of what he terms the "complex."

Nor is the "transition" so "easy and gradual," as a comparison of different parts of the work will show.

Section I. contains five lessons, and occupies fourteen pages. The first question of Lesson I. is: "If I have two cents in

one hand, and one cent in the other, how many have I in both?" The last example in Lesson V. is: "Think of a number; multiply it by 5; multiply that by 4; divide the product by 10; multiply by 6; divide by 3; add 30; subtract four times the number; divide by 5, and name the quotient."

Remembering that, according to the author's plan, the pupil is not permitted to use the book during recitation, this seems to be a more rapid advance than "very young pupils" can make "with ease and advantage."

Section II. contains twelve lessons, and occupies twenty-eight pages. Here the pupil is supposed to get his first knowledge of fractional parts. In Lesson I., occupying two pages, the first question is: "If I divide an apple into two equal parts, what is one of these parts called?" and the last one is: "A merchant having forty barrels of flour, sold three-fourths of them, and then bought one-third as many as he sold. How many had he then?"

Within the compass of these twenty-eight pages, the whole matter of equal parts, or the author's "fractional world," prime and composite numbers, prime factors, and prime factors that are common; divisors, common divisor, and greatest common divisor; multiple, common multiple, and least common multiple, and the subject of powers and roots, are presented, all well arranged and clearly exhibited. But the minds of "very young pupils" must expand with a rapidity we have never witnessed, or this is more than they can master in the time allotted; and we

(1) BROOKS' MENTAL ARITHMETIC. Philadelphia: Sower, Barnes & Potts. 30 cents.

have no hesitation in cautioning teachers to be careful how they subject young children to such severity of effort.

For the older, *well-trained pupils*, the book furnishes an excellent means of mental discipline. Yet, even with these, we question whether that teacher will not be wise who shall omit many of the more complicated examples, as not yielding benefits corresponding with the effort which they require. Problems like the following can, without doubt, be solved mentally; but the time and effort can be employed more profitably in some other direction. Page 105: "A man receives \$530 to purchase sheep and cows; what sum will he expend for each, after deducting his commission, which is six per cent. of the money expended, provided he expends four times as much for cows as for sheep?"

Page 121: M.'s fortune, plus  $\frac{3}{4}$  of N.'s, which is equal to  $\frac{1}{2}$  of M.'s, is \$900; and if the sum of M.'s and N.'s be divided in the proportion of  $\frac{1}{2}$  to  $\frac{3}{4}$ , it will respectively give  $\frac{1}{2}$  of R.'s, and  $\frac{3}{4}$  of T.'s fortune; required the fortune of each."

THE names of Wilhem and Hullah have long been familiar to the musical world, on account of the eminent services rendered by these teachers of music in founding and conducting singing societies. The popular Orpheon Societies in France owe their origin and success chiefly to the labors of Wilhem.

To Hullah, England is in a great measure indebted for her monster choral festivals, which are unsurpassed even in Germany. The Orpheon Free Choral Schools in this country, which are doing such good work in diffusing musical instruction among the poorer classes, were founded by Mr. Hopkins, the well-known pianist and composer. For the use of these schools, Mr. Hopkins has prepared a little text-book, which, in its peculiar field, is calculated to be eminently useful.

Compiled from the works of Wilhem and Hullah, which have been standard text-books in their respective countries for many years, it is well fitted for the use of schools of all kinds. It is small, comprehensive, and very cheap.

ANOTHER valuable little work<sup>3</sup> on the same subject is "Trastour's Rudiments."

The first part gives a concise and progressive summary of the elements of music, in a manner peculiarly simple and attractive.

The last part contains separate chapters on the choice of a teacher, the choice of a piano, proper course of instruction, and also lists of classical works for the piano, suited to different stages of progress, from which teachers and pupils may gain many useful hints.

A MAN who, by his labor or ingenuity, enables others to do in one hour a work that heretofore has required two, adds so much to the life and happiness of his fellows. He is a benefactor as well as he who causes two blades of grass to grow in the place of one.

Mr. Towle, instead of simply deploring the teacher's dread—monthly reports—has endeavored to deprive them of their terrors by making them less laborious.

How well he has succeeded teachers can best decide. He has devised a class register<sup>4</sup> which shows a pupil's entire daily, weekly, and monthly account at a single glance.

It is arranged somewhat in the form of a ledger, and its comprehensive simplicity would delight a banker. In the majority of our schools, where Torn is classed with Dick in arithmetic, with Harry in geography, and all three recite together in grammar, it can not, on the whole, be so convenient as the common forms. But a few names can be entered upon a single page; and, unless the scholars are together in all their studies, the labor of hunting up each name for recording each recitation will more than exceed that gained in making up the monthly summary. For graded schools, however, for which it is designed, it appears to be just what is needed.

Less than fifty years ago, the nature of insanity was unknown. Men were blinded by the belief that mind was utterly distinct from body, and, conceiving that men-

(2) A METHOD OF TEACHING ORPHEON SINGING CLASSES. New York and Philadelphia: Schermerhorn, Bancroft & Co. Price 50 cents.

(3) *RUDIMENTS OF MUSIC*, for the Use of Teachers and their Pupils, and Especially Intended for Class-Teaching in Private and Public Schools. New York and Philadelphia: Schermerhorn, Bancroft & Co. Price 75 cents.

(4) *TOWLE'S SCHOOL RECORD*. New York: Schermerhorn, Bancroft & Co. Specimen pages, 10 cts.

tal diseases were incurable, cast out the lunatic as cursed of God. The error of this conception is now apparent. A miracle is no longer necessary to restore the insane. Diseases of the mind are diseases of the brain, are to be treated as physical diseases, and, in most cases, can be cured if treatment is resorted to in season.

For the thorough enunciation of this important truth, we are indebted to Dr. A. Briere de Boismont, whose "Rational History of Hallucinations" first brought the subject distinctly before medical men. The matter has since been carefully investigated by others, but with especial success by Dr. Forbes Winslow. In the introduction to his work,<sup>5</sup> Dr. Winslow urgently enjoins the necessity of early treatment in cases of mental disorder. He shows that contrary to the accepted belief, brain disease is insidious and of slow development. He asserts that few cases are, *ab initio*, incurable. Unfortunately, the symptoms of incipient insanity are overlooked, the eccentricities are viewed merely as outcrops of the disposition, and the truth is believed, too often, only when the disease has passed beyond the reach of medicine. In the first seventeen chapters, Dr. Winslow discusses the psychology of mental diseases, and the

remainder of the work is devoted to their pathology.

This treatise may well be termed exhaustive. Every source of information seems to have been rigidly examined. Every morbid phenomenon, mental and physical, is carefully marked, and its relations and results are traced in a manner almost painfully detailed. One can scarcely overestimate the importance of this work. No better proof of its value can be given than the fact, that in three years it passed through three large editions in England, and a second has just been issued here. The style is far beyond that usual in medical or philosophical works; disfigured by no affectation of technicality, it is well fitted for the general reader as well as for the professional man. No person can peruse it without advantage.

THE American Journal of Science and Arts, for January, contains the following papers: Obituary of Sir W. J. Hooker, On a Boulder, and Glacial Scratches at Englewood, N. J.; Crystalline Nature of Glass; Contributions from the Sheffield Laboratory; Results of Observations on Drift Phenomena; A New Process of Elementary Analysis for the Determination of Sulphur in Organic Compounds; The Automatic Registering Barometer; On Molecular Physics, etc., with the usual scientific intelligence. The price of this Journal is now six dollars per annum.

(5) OBSCURE DISEASES OF THE BRAIN AND MIND. By FORBES WINSLOW, M.D., D.C.L., etc., etc. Second American Edition. Philadelphia: H. C. Lea. 8vo., pp. 453. \$4.25.

## NOTES AND QUERIES.

**MR. EDITOR**—Do you insert curious questions in Arithmetic? If so, here is one. The case actually occurred, and the question had to be solved by the court in the county in which I live:

**Problem.**—By the law of the State, an estate is divided, one-third to the widow, and two-thirds, in equal shares, to the children. If a child dies afterward, the widow has half of its part, and the surviving children share equally the other half. A man died, leaving a widow and ten children. Afterward, before the final division, seven children died in succession.

**Required**—The shares, respectively, of the widow and the three remaining children.

[NOTE.—The answer is desired in a

convenient fraction, in small terms, which shall be a near approximation to the exact fractional results.] T.

## REPLY.

**T**HE query in the November number of the MONTHLY, concerning the capital of Maryland, I observe, has not yet been answered. Annapolis is, and has always been, our capital.

On the 25th of April, 1861, Governor Hicks convened the Legislature at Frederick, because Annapolis was occupied by the military. Only one session was held there, and our capital has never been any other than the "Ancient City."

MARYLAND.

## EDUCATIONAL INTELLIGENCE.

## NEW ENGLAND.

**MASSACHUSETTS.**—Governor Bullock, of Massachusetts, in his recent message to the legislature of that State, made some interesting statements concerning the effect of a State fund upon local liberality. A reserved fund, amounting to \$2,000,000, was completed in 1865. It was feared that the State fund would depress local beneficence; but the governor asserts the contrary. During the school year 1864-'5, all the municipalities in the State, with the exception of twenty-two, raised by taxation double the sum required by law for participation in the fund; and the whole sum raised annually for school purposes equals the fund itself. During the year \$1,940,000 was expended upon the schools, exclusive of money laid out on books and buildings. Governor Bullock urges upon the people the necessity of elevating the standard of compensation to teachers, as the only means of maintaining and enlarging the usefulness of public schools. Acting upon this suggestion, the town of Worcester has increased the salaries of its male teachers \$200, and those of its female teachers \$50 to \$75 beyond that of 1865.

—Harvard College is at last freed from immediate State control. The overseers and corporation have both accepted the act passed by the legislature last winter, relating to the choice of overseers. It thus becomes a law, under which overseers are to be chosen by the Alumni on Commencement Day.

## MIDDLE STATES.

**NEW YORK.**—The report of the Regents of the University represents the educational institutions of the State as prosperous. The Superintendent of Instruction shows that there was, during the past year, a great gain in the number and average attendance of pupils. There is an increased solicitude on the part of parents for teachers of higher qualifications. School Commissioners are more attentive than formerly. The Normal Schools were well attended, and the number of teachers instructed in institutes was 8,741. In his message, Governor Fenton suggests the propriety of establishing other normal and training schools. Those already existing are insufficient to supply the demand of the common schools, which require more than twenty thousand teachers annually. The manner in which the school fund is apportioned works well, and induces a better average attendance. Governor Fenton maintains the importance of sustaining the schools more liberally than at present.

**NEW JERSEY.**—The Board of Education in Camden are about to build a new school-house, at a cost of \$20,000.

**PENNSYLVANIA.**—The late Jno. M. Porter, of Tarentown, left about \$120,000 for the establishment of a college at that place.

## WESTERN STATES.

**OHIO.**—The Secretary of the Ohio Agricultural Society wrote some time ago to Liebig, respecting the agricultural college about to be established in that State with the proceeds of the government lands. Among others, the answer contained the following observations, which are especially worthy of careful consideration: "In America you spend too much money in putting up your educational buildings, and then starve your professors. I learn that you put up a very grand building in your city of Columbus, called the Starling Medical College. I have a picture of it. I am told that it cost some \$70,000 or \$75,000, and now you are starving the professors in it. You did the same in Cleveland and Cincinnati. Then, I am told, you built two universities in Ohio, and now the professors can hardly live on the salary you pay. The consequence is that these schools, colleges, or universities must run down. There is no place in the whole world where knowledge can make so much money as in America; therefore your best men will not become teachers or professors, simply because they can make more money out of something else; and they naturally apply their talent and ability where it pays the best. No man will engage in an educational course of life, for life, on a salary of \$1,200 or \$1,500 a year, when he, by applying the ability in some other pursuit, can make \$4,000 or \$5,000 a year. Hence, you have no first-class professors in all America; but you have instead first-class business men, first-class mechanics, and managers of large and colossal establishments."

**KANSAS.**—Kansas does not appear to be satisfied with mediocrity in matters of education. She has an excellent school law and an increasing school fund. A State Normal School is in operation at Emporia, and Teachers' Institutes are being organized in different parts of the State.

There are in the State, School Districts, 843; school children reported, 45,441; number attending school during the past year, 26,000; number of teachers employed, male, 247—females, 652; average price paid the former, \$36.34; the latter, \$24.04; amount raised by districts for school purposes, \$107,293.41; value of school-houses over \$122,000.

There are in Southern Kansas seven colleges—*sic* too many. Five are in operation. The State University, at Lawrence, is nearly completed. It will soon be organized, and opened for students. It has an endowment of 46,000 acres of land, and \$15,000 as an initiatory investment.

The Agricultural College movement, under government auspices, is going on with considerable energy. During the month of November, 1865, two thousand five hundred acres were located at Humboldt, Kansas, with Agricultural College scrip.

MICHIGAN.—Michigan State University, at Ann Arbor, seems destined to take the lead of American institutions in number of students. At present the attendance is 1,179. It is well endowed by the State, and the charges for tuition are merely nominal.

—The Detroit Board of Education, having under consideration the necessity of increasing the compensation of teachers, have drawn up the following table of salaries paid by Western cities:

	Average No. of scholars, 1865.	No. of teachers.	Average No. taught by every teacher.	Average salaries of male teachers.	Average salaries of female teachers.	No. of male teachers.	No. of female teachers.
Cincinnati	17,331	873	47	\$1,500	\$475	63	310
Cleveland	5,288	113	47	1,200	465	15	98
Toledo	1,875	43	44	1,100	423	6	34
Chicago	12,688	240	53	1,450	485	23	217
Louisville	6,329	142	48	1,166	466	25	107
Detroit	5,481	86	*63	993	385	8	78

\* Or 56 by throwing aside half of the half days.

This board has taken energetic measures to meet the demand for more room. New buildings are to be erected immediately. The School Library has received an addition of nearly four thousand volumes, and the schools generally are in a prosperous condition.

TENNESSEE.—On January 22d the Free-School Bill was defeated in the Senate by a vote of nine to eight. There is no hope of its passage during the present session.

#### SOUTHERN STATES.

SCHOOLS FOR THE FREEDMEN.—The consolidated report of the Freedmen's Bureau shows that there are at present 631 schools, with 1,240 teachers, and 65,334 scholars, in the Southern States. There are 67 schools, with about 7,000 scholars, in North Carolina. In the District of Columbia and the surrounding stations there are 45 schools, with 100 teachers, and about 4,000 pupils. In Louisiana the schools for colored children have all been suspended, for want of funds. The agent of the Freedmen's Bu-

reau in Alabama writes that he has established a school for the poor whites.

MARYLAND.—Hon. Henry Barnard, LL.D., the veteran educator, has been called to take charge of St. John's College, at Annapolis.

The legislature of Maryland has just passed a bill in aid of St. John's College, by which \$85,000, in annual instalments of \$15,000, are appropriated from the State Treasury to aid in reorganizing this venerable institution.

GEORGIA.—The late constitutional convention ordained that the State University should be adequately endowed. To this the Governor, in his message, referred, and anxiously pressed the matter upon the legislature: "Located in a healthy region, the University of Georgia can, and ought to be made, more than ever the cherished object of the affections of her people." There is now a prospect that the endowment will be completed as soon as possible.

WEST VIRGINIA.—Governor Boreman, in his message, presents very distinctly the defects existing in the school system of this State. The want of competent teachers throughout the State is seriously felt, and "is one of the greatest difficulties in the way of putting into successful operation the free-school system, and, indeed, of keeping up primary schools of any character whatever." Normal schools are recommended as the only means of removing the difficulty. The Governor concludes by invoking the fostering care of the legislature over the free-schools.

—The Board of Education of Wheeling have ordered the erection of several new school buildings. The schools are in good condition.

#### EUROPE.

ITALY.—The Minister of Education has published the following particulars regarding the seminaries in the kingdom: The total number of them is 260, 208 of which are elementary schools. There are 13,174 pupils, 7,926 of whom are boarders, and 8,429 are dressed in ecclesiastical costume. During the last five years eighty-two seminaries were closed. The government now purposes to take all the revenues of these establishments into its own hands, and to reduce the number of seminaries to that of the dioceses.

RUSSIA.—The emancipated serfs, in a district of the government of Iver, are about to establish public schools in all the villages of the different parishes. In other parts of Russia, progress in this respect is rather slow; but there is every reason to believe that the enjoyment of liberty will more and more rouse the mental ambition of the peasantry.

SCOTLAND.—The Edinburgh Courant has the following characteristic letter from Thomas Carlyle to Mr. Adam White, who proposes to introduce the teaching of natural history into boarding-schools and private families: "For many years it has been one of my constant regrets that no schoolmaster of mine had a knowledge of natural history, so far, at least, as to have taught me the grasses that grow by the wayside, and the little winged and wingless neighbors that are continually meeting me, with a salutation which I can not answer, as things are. Why didn't somebody teach me the constellations, too, and make me at home in the starry heavens, which are always overhead, and which I don't half know to this day? I love to prophesy that there will come a time when, not in Edinburgh only, but in all Scottish and European towns and villages, the schoolmaster will be strictly required to possess these two capabilities (neither Greek nor Latin more strict), and that no ingenious little denizen of this universe be thenceforward barred from his right of liberty in those two departments, and doomed to look on them as if across grated fences all his life! For the rest, I cannot doubt but, one way or other, you will, by and by, make your valuable, indubitable gift available in Edinburgh, either to the young or older, on such conditions as there are; and I much recommend a zealous and judicious persistence till you do succeed. Believe me, yours very sincerely, T. CARLYLE."

THE NATIONAL ASSOCIATION OF SCHOOL SUPERINTENDENTS.—The National Association of State and City School Superintendents met in Washington, D. C., on the 6th of February. Massachusetts was represented by Mr. Northrop, State Agent of the Board of Education, and Mr. Hubbard, Superintendent of the Schools of Springfield; Vermont, by Mr. Adams; New Jersey, by Mr. Harrison, State Superintendent, and Mr. Sears, of Newark; Pennsylvania, by Mr. Coburn; Ohio, by Mr. White, State Superintendent, Colonel De Wolfe, of Toledo, Mr. Mitchell, of Columbus, and Mr. Cowdery, of Sandusky; Illinois, by Mr. Bateman; Michigan, by Mr. Horsford, State Superintendent, and Mr. Dety, of Detroit; West Virginia, by Mr. White.

Mr. Richards, of Washington; Mr. Payne, of Virginia; Mr. Fiske, of North Carolina; Prof. Davies and Dr. Lambert, of New York, and many other friends of education were present.

It was thought by some that, like too many educational meetings, this would prove to be only another phase of the Mutual Admiration Society; but such practical men as the superintendents of Vermont, Pennsylvania, and Ohio are not likely to misspend time; and the action of the meeting was directed so as to make it eminently successful.

The President, after the old-fashioned way in vogue in Boston, was somewhat prolix when calling on and referring to persons; but the members meant business, laudably exhibiting that if they were not fitted for their offices when elected or appointed, they were anxious to prepare themselves for performing their duties acceptably and well.

Several papers were read and discussed in a sensible, familiar manner, questions being asked so as to bring out practical bearings. In this way Mr. Coburn, of Pennsylvania, was lead to make many interesting and valuable statements concerning the character and working of the school system of Pennsylvania—in what respects he thought it might be improved, and how applied in other States. He thought it would not, on the whole, work well in New York; nor would the system of New York answer for Pennsylvania. The opinion of the convention was, that different States required different systems or modifications of them. Mr. Coburn's paper was pointed and practical. It should be in the hands of every superintendent.

Mr. White, of Ohio, read an elaborate paper on the establishment of a national bureau of education.

The convention seemed to be in favor of such a bureau, provided it be of limited controlling power; it should be advisory merely.

The paper of Mr. White was highly commended for its literary, logical, and especially its business character.

Mr. Van Bokkelen, with his usual enthusiasm, expressed his opinions on uniformity in State and national education. His plans were thought to be somewhat visionary, and to depend upon more stringent laws than most of the superintendents thought desirable—tyranny, even in a good cause, being, at least, a bad example. This was evidently Mr. Harrison's opinion, as expressed in a very correct review of some of the defects of educational systems.

Mr. Bateman also expressed similar opinions in his excellent paper on a model system.

Mr. Philbrick, of Boston; Mr. Bulkley, of Brooklyn, and Mr. White, Secretary of the Board of Education of Massachusetts, were unavoidably absent. The papers which they were to read were consequently deferred to the next meeting of the Association, to be held in Indianapolis.

The meeting was presided over and conducted with pre-eminent ability and courtesy; and its conclusion was regretted by all who attended.

Of the benefit to be derived from such meetings, it is scarcely necessary to speak.

The leading men of the various sciences and arts have long found it of advantage to meet and discuss the various questions that arise in their respective pursuits, and why may not Education be advanced in like manner?

## SCIENCE AND ART.

**NEW MEXICAN DISCOVERIES.**—The presence of a man on the Mexican throne who is a patron of science and art, though personally disagreeable to America, is certainly useful to the progress of knowledge. He sends out explorers to all parts of the country, who find many indications of that wonderful wealth and intelligence which abounded in Mexico ages ago, in a degree which has not been approached there for centuries. The last discovery, in the midst of a large forest, is the ruins of a city built and inhabited by the aborigines long before the time of Cortez. This city is of considerable extent, surrounded by a stone wall five yards in thickness and ten feet high, and having its streets paved with polished stone. Many fine specimens of architecture were discovered; among them a magnificent palace, supposed to have been the residence of some Indian king, and also statuary and paintings of a superior character, monuments, reservoirs, aqueducts, canals, and many concomitants of a civilized and educated condition of society.

—Dr. Charles Clay, of Manchester, England, has a portrait of Shakspeare, which he claims to have been taken from life by a contemporary of the great dramatist, and which is far more satisfactory than the celebrated Chandos picture. An English journal says of it:

"The face is thoughtful and slightly touched with melancholy, the eyes being remarkably expressive and pleasing. Many critics have objected to the Chandos portrait on account of its foreign cast of features. Here we have the type of a true Englishman, of the true Elizabethan period. There are no earrings, as in Chandos' picture, the clothing being simple and unadorned; the collar is without strings, less in size, and where it meets in front shows a portion of the throat below the beard; the collar itself is not so stiff as in other portraits. If we might venture on an opinion from the luxuriance of the hair, which is of a rich brown, tinted with auburn, this picture must have been painted at an earlier period of life than the Chandos portrait. The face is nearly full, the hair higher over the forehead, and falling partially and gracefully over the collar on the left side. The portrait has been carefully relined, and is in an old-fashioned frame of the period."

—A brass made of sixty parts copper, thirty-eight parts zinc, and two parts iron, may be forged at a red heat, and will support a "breaking weight" of twenty-seven tons per square inch. This has been used with success for bolts in the fire-boxes of locomotives.

—The famous German chemist, Mitscherlich, at the conclusion of a paper discussing his observations of the "spectral lines" given by various non-metallic bodies, states that he believes all the so-called non-metallic elements to be compounds.

—A beautiful variety of ornamental glass has been devised by M. Pelouze: 250 parts of white sand, 100 of carbonate of soda, 50 of limestone, and 40 of bichromate of potash are fused together. A glass is thus formed of a rich green color, filled with golden spangles.

—The editor of the British Journal of Photography speaks in terms of high approval of the rectified wood spirit, or methylic alcohol, as a solvent for gun-cotton in making collodion, in place of the usual mixture of alcohol and ether. In these times of dear alcohol this is an important matter to photographers.

—In 1777 average life in France did not exceed twenty-three years; in 1798 it had risen to twenty-six years, three months; in 1836 it was thirty-three years; and at present it has reached the very high figure of thirty-nine—an increase of six years within a period of twenty-eight years.

—An arctic expedition is being organized in Prussia. Three vessels will be fitted out, their crews to consist of scientific men from the Prussian schools.

—The French emperor is organizing a scientific exploration of Camboge, from the source of the Mer Kon to Thibet, where this river apparently disappears. Most of these regions are unknown, although the ruins discovered in the known districts would seem to attest the existence in former ages of a high state of civilization there.

—A Finland newspaper mentions a stone in the northern part of Finland which serves the inhabitants instead of a barometer. This stone, which they call ilmokiuri, turns black or blackish gray when it is going to rain; but on the approach of fine weather it is covered with white spots.

—Dr. Calvert, in his last "Cantor Lecture," gives a recipe for cleaning silver articles without the troublesome and destructive use of polishing powders. The articles should be plunged for half an hour in a solution made up of one gallon of water, one pound hypo-sulphate of soda, eight ounces sal-ammoniac, and four ounces of aqua-ammonia or hartshorn.

**A NEW PROCESS OF PHOTOGRAPHING ON WOOD.**—For decorative purposes, it is

said, it will be advantageous, as pictures can be transferred to panels, ceilings, or any surface that may require ornamentation. Graining can by this new process of photography be multiplied, and transferred to a surface with accuracy. For household ornamentation, and for decoration of public edifices, this method of applying photography is said to be economic in its application and artistic in its effects, while it is as durable as the material on which it is transferred.

—An aerolite fell at Shergotty, India, on the 25th of August last. A native witness states that about 9 A. M. a stone fell from the heavens, accompanied by a very loud report, burying itself knee-deep. The sky was cloudy at the time, and of a murky color; the air calm, and no rain.

The stone has been forwarded to the Asiatic Society of Bengal.

**DIAMOND.**—Contrary to the usual opinion that the diamond is produced by the action of intense heat on carbon, Herr Goeppert asserts that it owes its origin to the action of aqueous agencies. His argument is based upon the fact that the diamond becomes black when exposed to a very high temperature. He considers that its Neptunian origin is proved by the fact that it has often on the surface impressions of grains of sand, and sometimes of crystals, showing that it has once been soft.

**SEWER RATS KILLED BY ELECTRICITY.**—A new and curious use of electricity is now made in the sewers of Paris. There, as is well known, the rats swarm by millions. Wires one hundred metres long, insulated from the ground by glass feet, and

connected with a strong galvanic battery, are placed in these subterranean walks. Little pieces of roast meat are attached to the wires at short distances, and the rats, nibbling at the bait, call down upon themselves the galvanic shock with terrific power. Death is instantaneous. The bait remains, to destroy other victims.

—Numerous remains of the dodo have recently been found in a morass in the island of Mauritius. A very complete series of the bones of this remarkable bird are now in the hands of Professor Owen.

**OZONE.**—A very important memoir has recently been published by M. J. L. Soret, on the density of ozone. He sums up our actual knowledge of the volumetric relations of this body as follows: first, Ordinary oxygen diminishes in volume when ozonized—that is, when a part of it is converted into ozone, by electricity, for example; second, When oxygen, charged with ozone, is treated with iodide of potassium and other oxidizable bodies, the ozone disappears without the volume of the gas changing; third, Under the action of heat, oxygen charged with ozone suffers an expansion equal to the volume of the quantity of oxygen that the gas would have been capable of yielding to iodide of potassium. These facts, he says, lead to the supposition that ozone is an allotropic state of oxygen, consisting of a molecular grouping of several atoms of this body. One of the simplest hypotheses in this matter, is that in which the molecule of ordinary oxygen is regarded as formed of two atoms, and the molecule of ozone as formed of three atoms.

## MISCELLANY.

**A PRETTY CUSTOM.**—One of the prettiest of Christmas customs is the Norwegian practice of giving, on Christmas day, a dinner to the birds. On Christmas morning, every gable, gate-way, and barn-door is decorated with a sheaf of corn fixed on the top of a long pole, wherefrom it is intended that the birds shall make their Christmas dinner. Even the peasants will contrive to have a handful set by for this purpose; and what the birds do not eat on Christmas day, remains for them to finish at their leisure during the winter.

—“Ashland,” so long the home of Henry Clay, has been purchased by the trustees of the Kentucky University for \$90,000. The farm contains about three hundred and twenty-five acres of the best land in the Blue Grass region. The Lexington Observer says: “The Kentucky Agricultural School, which is under the patronage of the State, as well as other schools of the University, will be established at Ashland,

and it is proposed to begin the improvements on a most magnificent and extended scale—one that will do credit to our State, and serve as a monument to the memory of Mr. Clay.”

**HONESTY IN A HURRY.**—An Irishman, having accidentally broken a pane of glass in a window, was making his way out of sight; but, unfortunately for Pat, the proprietor stole a march on him, and having seized him by the collar, exclaimed:

“You broke my window, fellow.”

“Agh, an’ sure I did,” replied Pat, “an’ be jabbers, didn’t you see me runnin’ home for money to pay for’t, ye spalpeen?”

**A CURIOUS FACT.**—The finest orange-trees in Europe, in the superb collection at Dresden, were brought as ballast, in the shape of mere blocks of timber, without roots or branches, in the hold of a German vessel, and found their way to Saxony. Some curious gardener, anxious to know

what plant furnished this new wood, planted them, but, unfortunately, mistook the upper end for the lower, and thus actually turned the poor mutilated tree upside down. Yet, in spite of this early mutilation, the long sea-voyage, and their subsequent cruel treatment, they have grown and flourished beyond all other orange-trees on the continent.

—Insects must generally lead a jovial life. Think what it must be to lodge in a lily! Imagine a place of ivory and pearl, with pillars of silver and capitals of gold, all exhaling such a perfume as never arose from a human censer! Fancy again the fun of tucking yourself up for the night in the folds of a rose, rocked to sleep by the gentle sighs of summer air, and nothing to do when you wake up but to wash yourself in a dew-drop and fall to and eat your bed-clothes.

**HOMER INFLUENCE.**—"We shall never know till we are ushered into eternity," writes a living author, "how great has been the influence which one gentle, loving spirit has exercised in a household, shedding the mild radiance of its light over all the common events of daily life, and checking the inroads of discord and sin by the simple setting forth of that love which 'seeketh not her own,' but which 'suffereth long, and is kind.'"

—The Falls of St. Anthony, in Minnesota, are rapidly undergoing a change. During the spring of 1859 they receded about two hundred and fifty feet to the middle of the river, and nearly one hundred and forty feet further the next spring. It is not improbable that in a few years they will be destroyed altogether, leaving nothing behind but a long reach of rolling, tumbling rapids.

—General Milroy has received, at Nashville, a collection of human remains found in ancient graves in Wilson County, Tennessee. They were taken from rough stone coffins, made of slabs put up in the shape of a box without cutting or hewing, and none of them exceeded twenty-four inches in length, the average being fifteen or eighteen inches. There are acres of these graves at different points, and there is not a large skeleton to be found.

—Montana, which was organized as a territory only about two years ago, now contains some thirty thousand inhabitants. The recent settlers are hardy, industrious, enterprising, and intelligent, and consist largely of families who will make the territory their future home. During the past year \$16,000,000 have been taken from the mines, and the revenue tax paid to the Government was \$1,000,000.

—At Acapulco, the pretty peasant girls have an ingenious device for selling necklaces made of shells, principally on the

days when steamers arrive. Handing you a necklace, they say: "Me give you a present, señor," and then retire with a low-courtesy; returning, however, in a few moments, they say, sweetly, "You give me present, señor, of quarter dollar," which you do at once, unless you have a heart of stone.

—"Pray, sir," said a judge, angrily, to a blunt old Quaker, from whom no direct answer could be obtained, "do you know what we sit here for?" "Yea, verily, I do," said the Quaker, "three of you for four dollars each day, and the fat one in the middle for four thousand a year."

—Plain Anglo-Saxon words—short words at that—are the strongest and most expressive. Words of Latin derivation are by many deemed the most elegant; but if one would cultivate a terse, vigorous style, let him make himself familiar with the shorter words of his mother tongue.

—A Paris butcher has obtained authority to open a shop for the sale of horseflesh, on the condition that he will construct a special slaughter-house for the horses, the flesh of which is to be sold as food. The slaughter-house will be placed under the superintendence of an inspector specially appointed for that purpose. The opening of the shop is to be celebrated by a grand popular banquet, at which horse-meat will form the principal ingredient of the dishes.

**PHARAOH'S SERPENTS.**—Dr. Littlejohn, of Edinburgh, warns the public against the use of Pharaoh's serpents," as they are called. These toys are a compound of sulpho-cyanide of mercury. The inhalation of some of these products is highly dangerous—viz., cyanogen, sulphurous and sulphuric acids, bisulphide of carbon and mercury, in vapor. The mass left after combustion is organic matter called "melior."

—Among the funds still remaining in the hands of the corporation of London is the sum of two hundred pounds a year, left in trust "to burn heretics."

—It is not by mere study, mere accumulation of knowledge, that you can hope for eminence. Mental discipline, the exercise of the mind, the quickening of your apprehension, the strengthening of your memory, the forming of a sound, rapid, and discriminating judgment, are of even more importance than the store of learning.

—The Rev. Dr. B—, while introducing to the audience Rev. Dr. S—, the famous missionary from India (his home by birth), concluded his remarks with the following left-hand compliment: "He comes to you from that land where every prospect pleases, and only man is vile." The modest missionary arose, and blushing rendered his thanks amid the irrepressible mirth of the audience.

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